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AND

DISEASES OF WOMEN AND CHILDREN

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    CIETY.

ORIGINAL COMMUNICATIONS.

CONSERVATIVE GYNECOLOGY.[1]

BY

JOSEPH TABER JOHNSON, M.D.,
Washington, D. C.

Mr. Chairman and Fellows of the American Gynecological Society:

WITH the twenty-fourth anniversary of our beloved Society comes our annual reunion for scientific, social, and literary purposes. One of the principal and most important points in the presidential address at the earlier meetings of our Society was to prophesy great achievements for our future, in the wider development of our art for the benefit and relief of suffering women. At our more recent meetings it has been with pride and happiness that the occupants of this chair have dilated upon the great good already accomplished and the more than fulfilment of the rosy prophecies of our early presidents. Especially when the Society celebrated its twenty-first birthday, our past, present, and future were eloquently portrayed and foretold in the presidential address of that year. The lamented and erudite Barker gave us the history of gyne-

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[1] The President's address, delivered before the American Gynecological Society at Philadelphia, May 24, 1899.

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cology from its birth at the organization of our Society; and
Dr. Polk, on its twenty-first birthday, traced the principal im-
provements in the evolution of our chief surgical procedures
from then, with all the crudities, uncertainties, and mortal-
ity, to now, when, aided by the lamps of science, we combat
sepsis and restore broken health. Great growth and greater
subjects have been discussed from this chair by master minds.
The brilliant lights of our special department of medicine
have shone from this stand, illuminating the pathway for the
humblest and least to follow in imitation of their greatness,
if they did not strike out for themselves in new lines and along
new paths. Even the formerly well-developed limits of the
obstetrical and gynecological fields have not held our expand-
ing and advancing members. The spirit of the age has been
caught. Fellows who had performed all the recognized gyne-
cological and obstetrical operations were not content to be sim-
ply doing them over again. They have improved upon and
mended our older ways. Gaps have been filled up. Places
made vacant by death, which at that time we thought, in our
grief, would always remain vacant, have been occupied by our
young men who have grown large enough to fill them. New
times and new circumstances always develop new men. The
world moves on in medicine as well as in law, politics, and
diplomacy. A distinguished professor of gynecology said to
me recently that thirty years ago, when he filled the chair of
obstetrics, diseases of women and children in a Western col-
lege, in his four months' lectures of a two years' course he de-
voted only three separate lectures to diseases peculiar to women.
Now he lectures twice a week, and gives a weekly clinic on
gynecology during seven months in a four years' course. Gyne-
cology did so much in originating and making possible what is
now known as modern abdominal surgery, that many of our
best medical colleges have seen the wisdom of linking the two
kindred subjects together in one chair and establishing regu-
lar professorships equal in rank and emolument to any in the
college, known as the Chair of Gynecology and Abdominal
Surgery.

The intimate, practical, working knowledge of the possibili-
ties of abdominal surgery, acquired and first demonstrated by
ovariotomists, has led on to greater expansion, skill, and a
matured judgment in things abdominal, so that naturally,
as by a kind of right of discovery or conquest, gynecologists
have had forced upon them the doctrine of expansion. By the

simplest and most natural kind of evolution the expert ovariotomist and hysterectomist becomes the expert abdominal surgeon. If he could successfully repair injuries to the intestines, ureters, and bladder produced by himself in separating adhesions from ovarian and uterine tumors, why was he not the best man to repair injuries to those organs received from other sources? For many years he was much more at home in this field than the general surgeon who sneered and scoffed at his temerity and called his abdominal surgery "abominable surgery." Having discovered and demonstrated by many difficult gynecological surgical feats the tolerance of that sacred membrane, the peritoneum, how natural it was that he should extend his lines of usefulness into the camp of his old enemy and operate for the relief of neighboring organs, with the location and diseases of which his progressive mind and trained fingers had made him familiar from frequent close contact.

Punctured or ruptured abdominal viscera he already knew how to successfully repair, and by easy and natural stages the expert ovariotomist becomes the expert nephrotomist, the hysterectomist, the nephrectomist; the gynecologist who could do hysterorrhaphy well can also do nephrorrhaphy well, and so on to resection of the ureter or its anastomosis with the bladder, the resection of intestines, their anastomosis and colotomy. From the right uterine appendage it was but a step to the vermiform appendix and another to the gall bladder. They were of kindred pathology and frequently adherent. Being united in life, why should their undoing be separated by the unwise lines of demarkation drawn between the gynecologist and the general surgeon? The diseases of the eye and ear in actual practice and the college catalogue are linked together. The rhinologist naturally drops into laryngology and is now gradually expanding in the direction of the thorax. Chemistry and microscopy are frequently merged into one. Urinalysis requires them both. The same professor teaches pathology and bacteriology. Expansion, then, is not a gynecological idea, but is a natural outgrowth of the situation. Acquired skill and experienced judgment, matured in the school of accident, emergency, and adversity, were not and could not be content to lie fallow except when called into active service by the unexpected complications in strictly special work. The successful gynecologist, from contact, from contiguity, from early and frequently from accidental and unintentional experience, from the universal and slowly acting laws of progress and evolution, and

from the everlasting and appropriate law of the fitness of things, has become the successful abdominal surgeon.

It is no more intended that all gynecologists should perform all the difficult and dangerous operations in abdominal surgery than that all general surgeons should. Training, experience, observing and assisting expert operators, should be the school in which the beginners should learn. A newly fledged gradu- ate should never put out his sign as a special laryngolo- gist, ophthalmologist, gynecologist, neurologist, or celiotomist. Knowledge of abdominal surgery is only acquired by hard work and large experience. It is never congenital. Useful, safe experience in every department of knowledge is the prod- uct of slow growth. The stages of evolution which finally result in the development of an expert gynecological, obstetri- cal, and abdominal surgeon are slow and in accordance with immutable laws. A dreaming idler or littérateur can never become an expert in our department of medicine. Influences which succeed in many other directions will never produce a safe or successful abdominal surgeon. They are not born like poets, artists, or musicians. They are made by hard work, bitter disappointment, hard knocks, severe, long, and special training in acquiring knowledge of special anatomy and his- tology. Many of the remarkable achievements which have astonished the world are the results of matured, specially edu- cated and trained judgment, and are not the blind following of cast-iron rules of practice or the parrot-like imitation of some one else—though I must confess that observation has led to the belief that it would be better and safer for their patients for some of our youthful aspirants for fame and fortune to follow more strictly the practice and example of successful operators, than to strike out for themselves in new and unex- plored lines of departure in abdominal surgery. This senti- ment might be construed by the progressive critic as opposed to the generally accepted and more or less universally acknow- ledged laws of human progress. It is admitted that some one must think out, or kick out of the traces, in order to secure progress, but let it not be the venturesome beginner who would rush boldly in where angels fear to tread. The abdominal cavity is not a good place for the tyro to experiment. The axiom an- nounced by a distinguished abdominal surgeon not very long ago has not even yet been accepted, that "the last has been said about ovariotomy"; but it must be admitted that when the rules of practice are transgressed which have been worked

out by our best men, strict adherence to which has resulted in the reduction of its mortality from 75 and 50 per cent down to 5 and 3 per cent, and practically to no mortality whatever, barring unavoidable accidents with the anesthetic, the ligature or with undiagnosed malignancy—by an operator who is thirsting for fame, fond of display, eager for applause and for the public announcement of his name with the modification or the invention of some instrumental device or method, the practical use of which results in disaster—he should, we say, be compelled to present a very good explanatory excuse to escape censure.

I have delayed already too long in this address the expression of my heartfelt thanks and appreciation of your very great kindness in electing so unworthy a Fellow and the youngest founder to preside over the scientific discussions of this Society in the year of our Lord 1899. While your President is conscious of no scientific attainments or wonderful skill which would entitle him to this great honor, he is glad to attribute his undeserved and unexpected promotion to your very great kindness of heart and to our pleasant acquaintance and friendship during the twenty-four years of the Society's existence. It is most fervently hoped that we may all live to celebrate our golden wedding twenty-six years hence, when we would see many of the vexed and mooted points in gynecology, abdominal surgery, and obstetrics settled. Possibly as many more would arise for settlement and the peace and quietness of our lives be as much disturbed then as now. Our first President having covered the historical ground from the beginning until 1874, and our twenty-first President having referred very eloquently to our infancy, youth, adolescence, and maturity, there is little ground left to cover in the direction of reminiscence and prophecy. My immediate successor will have the possibilities of two centuries in medicine for his inspiration—the ignorance and shortcomings of the past, the enlightenment of the present, and our hopes and aspirations for the future. In glancing over not only the presidential addresses of the past twenty-three years, but the pages of contents of our twenty-three volumes of Transactions, one cannot help feeling a sense of pride and congratulation that he enjoys the pleasure, the profit, as well as the distinction of being one of the humblest Fellows of a Society which has produced such an admirable historical and working library of useful knowledge. The seeker after a suggestion of a theme for a future presidential address will stand

appalled as he glances even at the backs of these twenty-three volumes of Transactions upon his library shelves, knowing full well that all the live subjects and burning questions of the hour have been thoroughly, scientifically, and eloquently discussed in able papers within their illuminated covers. What is left of interest or profit for discussion on this occasion ? Of threadbare themes and wornout arguments there are a plenty. A subject which is not new might fail to be interesting, while if it were it might still fall short by its method of presentation and dry description of the slow stages of its evolution.

On the present occasion your attention will be briefly drawn to a few practical points concerning the hopelessness of the average vaginal hysterectomy for cancer; conservatism in gynecology, including a few observations upon the vaginal *versus* the abdominal operation for the relief of some of the diseases of women until recently exclusively performed through the abdomen. The gravity and increasing importance of the malignant diseases of the female pelvic organs are more keenly appreciated when we come to more fully realize their increasing and alarming frequency among the better classes of our people.

Recent statistics show in England, Germany, and the United States that cancer of the uterus is more frequently seen among the better than the poorer classes of society. A very reasonable deduction from this statement is that something in the manner of living, and especially of eating, has· an important causative influence.

Dührssen says it is questionable if the profession knows *how many women die of cancer each year*, and how it increases despite the fact of the better condition of the people. This is in contradiction to Schröder, who wrote that it was a disease of the poor and poorly nourished. Dührssen claims that most of his cases are from the better classes, as does Williams, and asserts: 1. That the improvement of the condition of the people in England has doubled in the last one hundred and fifty years; poverty is one-half less; but, despite this, cancer has increased fourfold. 2. The mortality from cancer is least among the poor and greatest among the rich. 3. In Ireland, where people are as poor now as fifty years ago, cancer has not increased. Williams gives over-nourishing and an easy life as predisposing causes. In rich West London the cancer mortality is twice that in the poor district of East London, while among savages it does not exist. Of 325 cases of

cancer in females, none were in prostitutes; and of 160 cases only one patient had had syphilis (Williams). Dührssen states that 25,000 women out of 25,000,000 in Germany die of cancer uteri: of these only 10 per cent to 30 per cent are operable, and only one-third or one-fourth of the operable ones remain free from a return : hence only one-tenth of all cases of uterine cancer are saved from death by operation. To ame-liorate this condition, he says, an early diagnosis should be made. This can be done by teaching women to seek (1) a physician's help in case of the smallest discharge or least sign of abnormity in the hemorrhage; (2) by obtaining the pa-tient's consent to a thorough examination, bimanual and in-strumental, by probe, excision, curettage, and exploration of the uterine cavity; (3) after diagnosis, her submission to ex-tirpation of the uterus.

The growing importance of this subject demands for the cure of the unfortunate patients that we see them earlier than the average case comes into the hands of the gynecologist. The utter hopelessness of any treatment except the most radi-cal operation, and that at an early stage of the disease, should lead the general practitioner to be more constantly on the alert to discover any symptoms of a suspicious nature in his patients approaching the menopause.

The unreasonable and groundless impression among the people, and too frequently also entertained by the family phy-sician, that anything which is all wrong at that time can pos-sibly be all right at any time, should be effaced by the empha-tic teachings of such a society as ours. It has been too often lamented by all concerned that when the trusted family phy-sician had finally concluded that his remedies and the lapse of time were not accomplishing all he had hoped they would, and when the painful and offensive symptoms had become too in-tolerable to be longer endured, a specialist would be called in, to find, alas, that the disease had already progressed so far that any operation known to surgery would be of no avail. Unfor-tunately this stage is too frequently reached before the uncured pains and discharges drive the patient to the surgeon. The sad picture will arise in the minds of every one present here to-day of cases seen too late to be of the slightest benefit surgi-cally, and the memory of the tears and distressing cries for help from the stricken wife, the heartbroken husband and family, will linger in his memory for the remainder of his life. The plea of the family physician that he thought her troubles natu-

ral to the change of life, and that with its establishment her symptoms would disappear, should be ruthlessly destroyed by leading operators who know better. This unaccountable and actually foolish notion, which has been responsible for the loss of so many valuable lives, should receive an early deathblow by the strongest enunciation of correct views. One of our Fellows has recently written a valuable book on the menopause which has done much good in this direction already. It is only the reiteration of a threadbare truth to insist again that for even a radical operation to be successful a correct diagnosis must be made so early that contiguous and unremovable tissues have not become affected. When they are, it is, of course, too late for an operation to succeed. It has recently been shown by Clark and Ries in this country and by Rumpf in Germany that, as a rule, the patient is not cured when even a movable uterus has been successfully extirpated, if the lymphatic glands have been previously infected. Dudley and Kelly have insisted upon this point in their recent valuable books, and present beautiful illustrations which have a great teaching force and value. The infection of these glands demonstrates the utter uselessness and hopelessness of many vaginal hysterectomies for cancer, and also the manner and source of the return of the disease. The two great lessons which we are to first learn ourselves and then teach to the present and coming generation of students are, first, early diagnosis; and, second, early, radical, thorough, complete operation through the abdomen, if the pelvic lymphatic glands have become affected. In my own experience of 44 vaginal hysterectomies for cancer, 2 died within a week from the immediate effects of the operation, and, so far as I can learn, 40 have died since from a return of the disease, and only 2 are known to be alive to-day, and one of these, operated upon just a year ago, has symptoms of a return. Dr. McMurtry, of Kentucky, in a paper on cancer of the uterus read before the Southern Surgical and Gynecological Society in Memphis last November, gave his own statistics, which were very similar to mine, and quoted several operators with similar experiences; while a majority of those discussing the subject confessed that vaginal hysterectomy for cancer, in their hands, had almost invariably been followed by a fatal return of the disease. Why is this? Is it not because Clark and Ries are right, that infection of the lymphatic glands has preceded the surgeon's knife, even in a movable uterus, and has thus rendered a complete and successful vaginal hysterectomy

an absolutely useless as well as hopeless operation? On broad surgical principles it might be stated that no operation for cancer can ultimately succeed which does not remove all infected tissues, be they connected with the lateral surfaces of the uterus, the appendages, or the lymphatic glands. The same principle is being acted on in operations for the cure of cancer of the breast. Glands not only in the axilla, but between the pectoral muscles, between the ribs, under the clavicle, and up in the neck, are sought out and removed by the surgeon in his attempts to prevent its return.

Halsted tells me that he does not hesitate to keep a patient under ether four hours and to apply from 150 to 200 hemostats in an operation for the removal of mammary cancer. While this would not be safe practice within the abdomen, the principle of thorough removal of all possible infected glands seems to be the only safe one to follow.

CONSERVATIVE GYNECOLOGY.

The discussion of the question or practice of conservatism in gynecology seems of late to have aroused almost as much bitterness in medical societies and journals as has the discussion as to which is the correct method of baptism among the churches, or the doctrines of free silver or expansion among the politicians; and yet this ought not to be so.

Probably no good man, advocating his views with all his power and persistence, wishes to be understood as blindly and foolishly advocating or doing operations always in one way. That would be more foolish than to continue to always follow hard and fast lines simply because he always had, when other and improved methods showed better and more conservative results.

Like the famous discussion as to the color of the shield, it was found, later on, when the clouds and the smoke of battle had rolled by, that both were half right and both were half wrong. It depended upon the point of view. Those insisting upon the color of their side had not considered the question from the point of view occupied by their opponents.

Much misapprehension has existed. A perfectly clear definition of what is meant by conservatism might perhaps have prevented some heart-burnings and many misunderstandings.

The writers of papers on conservative operations upon the ovaries and uterus, or upon vaginal *versus* abdominal operations for pus and other things in the pelvis, have perhaps too

frequently been placed on the defensive in the argument, and been compelled to explain over and over again that they did not intend or wish to altogether abandon abdominal for vaginal surgery, and to explain that there were proper limits to the practice of conservatism.

It is perfectly evident to thinking men of experience that honest conservatism must have quite a range of application. The most conservative treatment—that is, the treatment that will best conserve the present and future interests of a patient— might require the performance of the most radical kind of operation, and *vice versa*. It is as impossible as it is unscientific to draw hard and fast lines and apply them to all cases. What is best for the circumstances and environment of one patient may be the worst for another. An expert operator by both methods might think it safer and better to shorten the round ligaments, remove a small ovarian or uterine tumor, or empty and drain pus tubes through the vagina from a patient in the wards of a charity hospital, when he might think it best to operate by the abdominal route in a patient able to control an environment favorable to a perfect convalescence, a full restoration to vigorous health, and the prevention of ventral hernia.

Few in this age will oppose the statement that it requires a higher order of ability and is a truer and nobler triumph of our art to save an organ or part of an organ than it does to destroy it by sacrificial surgery.

In the early days of our Society and before its organization, reputations were made by such thorough removal of ovarian and uterine growths as to prevent forever any further exercise of function by these important organs. Now, thanks to a wiser and truer conservatism, the most skilful and conscientious operator is not only not ashamed of, but takes a just pride in, his ability to save instead of destroy. He removes by resection or enucleation the diseased portions of the ovary and tube, or by myomectomy removes the tumor *from* the uterus, and saves the woman her sex with its glorious possibilities.

A conservatism which can accomplish this is undoubtedly of a higher order than a radicalism which would invariably, by an unyielding cast-iron sort of a rule, when once the abdomen was open, make a clean sweep of all the internal organs of generation, and, as advocated by some, the vermiform appendix if it came in sight.

Perhaps the name " conservatism " is not now a good one for this kind of surgery. Its early abuse and the many acrimo-

nious discussions in our medical societies perhaps make it an unfortunate and misleading term for the good work which is at the present time done in its name. While a good operator in what has been termed the radical camp might not admit that he was doing any conservative work, in fact he might be out-heroding Herod under another name. Some of our most radical work is in reality and literally the most conservative, while some of the operating done in the conservative camp is, in an etymological sense, the most radical, inasmuch as it results in the complete and permanent cure of the patient, while at the same time it leaves her in a condition to menstruate and bear children.

Some have gone so far as to denounce in the strongest terms the conservative treatment of diseases and tumors of the ovaries and uterus as chicanery and quackery; but of course they meant to denounce, as all honest men do, that spurious and commercial variety which, it is claimed, has sometimes been publicly paraded to catch the unwary and timid and selfishly turn their misfortunes and ignorance to the furtherance of their own base ends.

While a black sheep or two may, and probably does, exist in nearly every flock, observation has not yet demonstrated them to be more numerous among those doing what is called conservative work than among their unfriendly critics.

The greatest amount of honor, honesty, thoughtful and conscientious desire to do the greatest amount of good to the greatest number of their patients, exists in equal proportions, I believe, in the camps of those now fighting upon different sides of the same shield.

There are probably very few, if any, expert and conscientious operators who are now doing some of their work by what is classed at present as the conservative method and the vaginal method, who are not actuated and controlled by just as honest and noble motives as actuate and control those who do all their work as near as they can in one particular way.

Indeed, it could be stated in stronger terms in another way, viz., that in gynecological as in general surgery a better and nobler exhibition of our art is made and a greater and truer surgical triumph accomplished by saving a diseased organ, or so much of it as to permit a continuance of its function, than is made by the universally radical operator who by his great skill successfully destroys it.

Aggravating but unintentional errors of statement do not

aid in restoring harmony in this discussion. It is claimed by prominent exponents of the exclusive abdominal route that the best work of the best operators should be considered as the standard by which its results can be only properly quoted or fairly judged; while the conservatives, who honestly think they can secure safer and better average results, immediate as well as remote, frequently come in contact with reports of many operations in general hospitals and throughout the country in small cities whose results, as stated, in badly adherent pus cases have been decidedly less favorable in their immediate results and post-operative sequelæ.

If half the abdominal work of the country is done by skilled experts in the great medical centres, what becomes of the other half ? Of this other half—granting, for the sake of harmony, that the first half are all cured—of those of the other half operated on by beginners, ambitious youngsters thirsting for fame, statistics, or fortune, by the inexperienced average surgeon serving his term upon the average hospital staff, very many more of them, it is claimed by the expert operators by the vaginal route, would be saved for present and future usefulness if most of those having aggravated forms of pus in the pelvis were simply opened, thoroughly irrigated, and drained through the vagina, than as if they had been operated through the abdomen.

Some of the operators just referred to have at times been more severe in denunciation of conservative abdominal and vaginal gynecology than their masters in the great medical centres, from whom they have tried ineffectually to learn to do expert abdominal surgery, and who furnish them or other skilled surgeons with not a few cases to do over again, repairing the bad results of work which had better never been undertaken. This class of work is admittedly very difficult and dangerous for even an expert to do, while it is claimed by the vaginal operators for pus that the few cases requiring operations through the abdomen to complete a cure can be much more safely laparatomized subsequently, owing to the greatly improved condition of the patient and her freedom from infectious pus.

The consensus of opinion, as I make it out, seems now to be in favor of leaving an ovary or a portion of the ovarian substance whenever possible, in young women especially. By so doing it is evident that menstruation will continue, the menopause with all its train of disagreeable symptoms will not

be prematurely and artificially precipitated, and the crowning glory of womanhood, which is undoubtedly motherhood, remain possible.

The radical objection was made early, and has since been made often, that to do any conservative abdominal or vaginal operative work upon the appendages, the remaining and surrounding tissues would be left in a condition favorable to the occurrence of inflammation, to such a degree as to require other and still more difficult operations to complete the cure— an opinion in which at one time I coincided. While these evil prognostications have undoubtedly been realized in a few isolated and accidental instances, sufficient evidence is lacking to prove this practice to be generally unsound or unwise; while, on the other hand, the conservatives adduce much evidence to support the wisdom and beneficence of their claims.

So much has been said and written and printed already upon conservative gynecology, and, from the announcements of our programme to-day, so much more is to be read and said and printed upon the advantages and probably the disadvantages of vaginal *versus* abdominal work in certain special cases, that to further dwell upon these subjects at this time and in this place would be only to anticipate what others will say much better later on.

President Lincoln said, in the course of his famous Gettysburg conciliatory speech near the close of our civil war, that the politicians could deceive some of the people all the time, and all the people some of the time, but they could not fool all the people all the time.

Without for a moment comparing myself with the President of the United States, I might still utter a kind of prophecy that during the next century some gynecologists may practise conservatism all the time, that all gynecologists will practise it some of the time, but that they *all* will never practise it *all* the time.

IS A SLOUGHING PROCESS AT THE CHILD'S NAVEL CONSISTENT WITH ASEPSIS IN CHILDBED?[1]

AN INTRODUCTION TO THE STUDY OF COMPLETE PRIMARY AMPUTATION.

BY

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(With fourteen illustrations.)

OUR cord surgery is prehistoric. It is not a little curious that the earliest operation in the world and the only one done upon every individual should be treated by measures that antedate our annals—namely, ligation and aseptic absorbent dressings.

This paper is a plea for the application, in amputating the cord, of the surgical principles that govern other amputations. The following principles are directly opposed to the prevailing practice, but would seem to bear upon the matter:

First—Mass ligature should be avoided. Hemorrhage follows the present method occasionally, because shrinkage of the gelatin loosens the seizure. Ligatures belong on bared vessels.

Second—A hernial opening should not be closed by a granulation scar. Primary union is readily substituted.

Third—If the location of the future line of demarkation is known, removal should be practised at or beyond that point. In the case of the funis one knows where the line of separation is to be.

Fourth—That form of operation should be chosen which will do away with sloughing or pus production. Prevention of suppuration, of putrefaction in the stump, and of systemic infection has been attempted by means of numberless devices and dressings spread through a voluminous literature of failure. Removal alone is prevention. The obstetric nurse will then no longer go from a pus dressing on the baby's abdomen to the fissured nipple, the perineal wound, the catheter, or, in small maternities, to the vulva of the woman in labor.

[1] Read before the American Gynecological Society, Philadelphia, May 24, 1899.

And, conversely, septic maternal discharges will cease to endanger the child's open wound.

To frankly sever the cord at the skin margin, with ligature of the vessels or suture, one or both, brings about safe, clean, prompt healing. Even the pressure of a pad and an adhesive strap may suffice. Thereby the navel of the second day looks like the navel of the tenth or fifteenth day under other methods. After succeeding with many cases of complete primary amputation, the writer found that Flagg had recently published the method in part.

Starting at Stutz's elaborate review, written twenty years ago, this paper brings the literature up to date. It is an introduction to the question of the complete method.

The Need of Better Results.—The general practitioner says he never sees septic navels. His eyes have no more been opened to umbilical infection than they were years ago to pelvic floor injuries, or than they are now to much maternal sepsis. Children die, suddenly or slowly, in the first month, as mothers die, of many vague diagnoses. The great maternities warn us of the actual death rate. Even there the diagnosis cannot always be made without section. Among 16 autopsies on new-born children who died from general infection, Ehrendorfer had made a previous diagnosis of sepsis in only 5 cases.

The statistics show much variation, but the best are bad enough. Eröss in 1,000 cases had 68 per cent of abnormal healing of navel wounds with $5\frac{1}{2}$ per cent of severe general infection. Miller, in the great Moscow Foundling Asylum, found from 40 per cent to 15 per cent of the early deaths due to navel infection—in all 500 to 900 a year. A single observer, Fürth, can report 308 cases of arteritis, and Von Hecker credits to sepsis 138 out of 281 deaths of the early weeks. Lambert lost 5 children in 147. Incidentally it may be noted that fifty papers on a subject in five years indicates dissatisfaction with results.

Morbidity and Mortality.—The best summary I can construct from the literature, which records observations on over 10,000 new-born children, is as follows. Necessarily it is not altogether clean-cut.

Fever due to navel infection, $3\frac{1}{2}$ to 22 per cent, studied on 2,755 babies (the higher percentages in summer); well-defined general sepsis, $5\frac{1}{4}$ per cent, the review embracing 1,329 babies; deaths from sepsis, a full 1 per cent, the material being 6,011 new-born children. The ratio of septic deaths

to early deaths from all causes varies between 15 *and* 40 *per cent.*

Once again Nature leaves us in the lurch. There is no " normal " process to fall back upon to justify apathy in this matter. Animals bite or tear off the cord; others devour placenta and cord together. Tearing through of the cord is effected very easily in the calf, as the cord is notably thin, but to tear off the human cord takes a definite amount of force, something less than the weight of the child (Budin). Sepsis in animals is frequent and fatal. Nature's results are bettered immensely by rigid cleanliness in the care of the cord and navel on the part of the veterinary.

The methods of primitive peoples take up sixteen pages in Ploss' entertaining book. Many travellers credit the commonness of umbilical hernia in the Sandwich Islands and South America, Senegal and Central Africa, to absence of ligation and the long, hanging, dragging cord, but it is possible that dirt, sepsis, and prolonged suppuration are more potent factors.

ANATOMY AND HISTOLOGY.

The Vessels.—There are a few facts to be gathered concerning the structure of the cord which bear on our inquiry. Stutz and Hyrtl cover the ground very fully. In comparison with other arteries, the tunica media of the funic arteries is remarkably thick and made up of an uncommonly highly developed, smooth muscular structure, alternately circular and longitudinal in direction. *The contractility is great and the resistance in the vessel wall is double the arterial blood pressure within it.* The vein possesses muscular fibres in such strength as only the veins of the lower extremities can boast. The three vessels have no vasa vasorum and give off no nutrient vessels to the cord structures. They have no nerves. So-called valvulæ Hobokenii are present, and they turn on their own axes in addition to their spiral course.

In practice I note that after section the arteries always contract to imperceptible calibre—" their lumen is *nil* "—while the vein stands open or collapses, side-wall to flabby side-wall. It is from the vein that I have seen bleeding. The vein often lies close to the cord sheath. The arteries, on the other hand, are readily isolated and stripped. The distance of the ends of the open arteries from the active blood current renders bleeding from them unlikely. Lack of contraction in the wall of the vein, however, permits a reflux, but it must be evident that the

blood pressure in the vein will be low and the direction of the blood current inward toward the heart, due to aspiration within the chest. Therefore arrest of bleeding is not difficult.

Ribemont (1) measured the resistance in the artery of a piece of fresh cord with canula, warm water current, and mano-meter. A pressure of 120 to 160 millimetres of mercury was necessary to overcome it, whereas the mean tension on the arterial side in the new-born is only 63 millimetres. In the veins the tension does not rise above 33 millimetres. The arterial pressure is therefore much greater than the venous, in case the ligation is done late—that is, when pulsation in the cord has ceased or nearly ceased. Ligation immediately after delivery depresses the arterial pressure 16 millimetres, while on the venous side it rises 18 millimetres or up to 51 milli-metres.

Capillaries of the Cuff of Skin.—The blood supply of the elevated skin edge (*portio persistens*) has been carefully studied and pictured by Hyrtl. By injection he proved that the arteries of the anterior belly wall, of the bladder, and of the liver take part in the production of the so-called circulus arteriosus umbilicalis. This is a subperitoneal wreath-like anastomosis of vessels surrounding the navel; it constitutes a free network in the adventitia of the intra-abdominal portion of the umbilical arteries and vein. From this circle the sub-cutaneous connective tissue of the navel and its integument is supplied by perforating branches. These little twigs break up into capillaries and form a subcutaneous circle distinctly distinguishable from the extra-abdominal tissues of the cord beyond.

Hyrtl pictures the capillaries running up on the cord sheath beyond the skin edge, and Stutz says his numerous researches show that they seldom stop at the dividing line, but extend 1 to 3 millimetres on to the amnion, and there the limit of them is sharply defined. "It is the zone which is injected a dark red just after birth." It is at this capillary edge that one may amputate.

The cord itself is nourished by endosmosis. No lymphatics exist in it, nor are nerves found.

The Shelf-like Projections or "Valves."—The Hoboken valves—so named by Hyrtl from an anatomist living in 1669 who described them—are those "rose-wreath or pearl-string-like dilatations and retractions" seen on the umbilical vessels. They are most distinct on tightly wound cords, and more

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particularly on the arteries. The valve lies mostly transverse to the axis of the vessel, being a crescentic shelf surrounding three-fourths of the lumen, projecting .3 to 1.5 millimetres, the calibre being almost blocked or cut across at times. These " valves " are therefore infoldings of the vessel wall. They check but cannot arrest the blood flow. They may be absent altogether.

Thrombosis, according to Stutz. is not the physiological method of closure of the vessels. The vessels of the cord not tied may bleed hours or days after delivery, if the child is placed in a warm bath or for other reasons develops an excited heart action. " A clot in the vein is a pathological symptom." Tarnier, Morris, and others say that a clot forms normally.

The Gelatin.—The jelly is thicker close to the vessels and the sheath, and merges imperceptibly into the connective tissue of the neighboring parts. A kind of central cord or string sends out three sections (chordæ funiculi) between the vessels and to the surface, to where the three whitish streaks are found. How much the jelly dips within the skin cuff I do not know. Little can be curetted out, yet some wounds, even after careful suturing, remain somewhat moist.

Sphincter.—Richet (1857) believes that there is a sphincter arrangement (sphincter umbilicalis) made up of smooth muscle fibres inside the ring of elastic fibres. Robin (1861) denies both muscle and elastic fibres within the aponeurotic fibrous umbilical opening. Certain it is, however, that the muscular fibres of the skin and the retraction of the vessels roll the navel inward and hold it gently closed. Morris (1893) says that at birth there is a distinct ring which can be felt for some time after in the flaccid walls of an infant's belly. The ring of infancy is closed and eventually becomes " a knotty mass of scar, the strongest point in the abdominal wall." This is brought about : 1. By changes in the ring itself. " The umbilical ring is surrounded by a *sphincter-like arrangement of elastic fibres*, best seen during the first few days of fetal [*sic*] life, on the posterior wall of the belly. In older infants these fibres lose their elasticity, become more tendinous, and then shrink more and more. As they contract they divide, as by a ligature, the vessels passing through the ring, thus accounting for the fact that the cord, wherever divided, drops off at the same spot and without bleeding." 2. Changes in the vessels themselves. The muscular tissue wastes, the connective tissue of the outer

coat hypertrophies and thickens.   Thus the umbilical vessels and the umbilical ring are alike converted into scar tissue. This remains weak for some time and may be distended by a hernia (infantile).

" In adult life the dense, unyielding fibrous knot consists of two sets of fibres, those decussating in the middle line, and two sets of circular fibrous bundles which interlace at the lateral boundaries of the ring.   *The lower part of the ring is stronger than the upper.*   The umbilical hernia of adult life, when it comes through the ring itself and not at the side, always comes through the upper part.   In the lower three-fourths of the umbilicus the umbilical arteries and urachus are firmly closed by matting in a firm knot of scar tissue ; in the upper there is only the umbilical vein and weaker scar.   Owing to the rapid growth of the abdominal wall and pelvis before puberty, and the fact that the umbilical arteries and urachus, being of scar tissue, elongate with difficulty, the latter parts depress the umbilicus by reason of its intimate connection with its lower half."   Retraction of the arteries is said by Robin to begin within a short time of delivery, and to commence some days ahead of the vein.

Shape of the Navel.—While much variety exists, the three commonest forms of the adult opening are (1) with its longest axis transverse, (2) that with the long axis parallel with the axis of the trunk, and (3) the round depression.   Of interest to us, as affecting the location of sutures, is the first, which is probably the commonest.   In this transverse slit either upper or lower skin flap may overlap, the edge being often crescentic in shape and the deeper flap showing a longitudinal furrow. The seated posture may tend to produce this formation.   All shapes alter with change in the attitude of the trunk, but the general trend of the deeper part is downward.

The prolongation of skin on to the cord when this is lifted is usually two centimetres or about the breadth of a finger.

THE PROCESS OF SEPARATION AND ITS PATHOLOGY.

Stutz, writing in 1878, concludes a very complete review of previous work, a paper of great scientific interest, which incorporates original experiments, by saying: " Mummification goes hand in hand with separation of the cord.   The point of demarkation between living and dead tissues is marked by a vascular circle.   The natural redness of this zone increases after the child is born, and the umbilical ring participates in this redness.

The cord begins to wither and the zone of radiating furrows appears in the amniotic sheath. At the end of forty-eight hours the sheath is loosened, the line being from 1 to 3 millimetres away from the skin edge, and in another twenty-four hours the vessels have dried up, the arteries first."

The whole process requires from three to five days, according to the thickness of the cord, the health of the child, and its state of warmth and dryness. The intra-abdominal part of the vessels retracts during the drying process and the cutaneous navel undergoes a sort of intussusception, by reason of which the inflammatory area is drawn almost wholly out of sight, so that the inflammatory and suppurating area is easily overlooked.

Stutz has no doubt whatever that the process of separation is inflammatory and this inflammation is therefore always present. The cord could not separate without this inflammatory process. A piece of umbilical cut off and laid against the child's skin within the bandage dries at the same rate as the attached piece.

Birch-Hirschfeld (1879) says that in 60 autopsies with septic infection emanating from the navel he found arteritis alone 32 times, phlebitis 11 times, the two together 3 times, and venous thrombi 4 times. Autopsies on foundlings show 16 per cent icterus. He thinks the umbilical vein the port of entry of the virus.

Runge (1) (1881) cites as a striking oversight the failure of the profession to apply antisepsis to the navel of the new-born. At Strassburg Maternity, in the summer of 1876, 5 children out of 120 died of navel infection. There were no cases of puerperal sepsis. At the Charité Obstetrical Clinic at Berlin there were, during the summer of 1879, 26 children who had umbilical infection, of which 16 died. There was a coincident epidemic of puerperal fever. In the same clinic, January–June, 1880, there were 40 cases of navel infection with 19 deaths; also 5 extra cases found post mortem not recorded during life. In these 24 cases the arteries were invariably influenced, the veins never. Our knowledge of arteritis [1] is in a chaotic state. Widerhofer found it a benign and local affection which never ended in pyemia. Bedner and Hennig concur. Runge finds it more or less malignant, able to destroy life without complications ; pyemia is a frequent complication, usually starting

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[1] "Arteritis" is the common spelling; "arteriitis" the more correct, according to Foster's dictionary.

from a periumbilical phlegmon. Buhl found that the lungs were never involved in arteritis, while Runge found pleurisy or pneumonia in 9 cases out of 24. Runge concludes that arteritis is malignant, as a rule, and kills chiefly by pyemia.

With regard to differential diagnosis between arteritis and phlebitis, Widerhofer says the latter is always complicated by fever and icterus. Runge agrees largely with this view, but Birch-Hirschfeld has found marked icterus with arteritis alone. Runge concludes that in arteritis the port of entry is always the navel wound and that the form of infection is always the ordinary septico-pyemia. The stump mummifies simply because conditions usually obtain which favor mummification. If these conditions fail infection may occur.

Experimentally, portions of fresh cord may be made to mummify or mortify according to the conditions of heat and moisture. With regard to priority of tissue involved in infection, Runge states that the lymphatics are the path of infection. A lymphangitis is the underlying affection. He does not believe it possible to diagnose arteritis during life.

Monti (1881) reports a case in full which ended fatally, and sides with Runge in his view that the disease may lead to infection. Monti's case presented icterus, erysipelas, splenic tumor, etc. It is remarkable that the peritoneum may escape in these cases. Runge found peritonitis only twice in twenty-four times. The symptomatology is negative.

Fürth (1884) gives the following diseases of the navel after the cord has separated: Umbilical excoriation, the uncicatrized state when the cord has separated. Blennorrhea—when the navel does not scar, it is transformed into a sort of mucous membrane and secretes mucus for a long time ; the vicinity of the umbilicus becomes involved, inflamed, or eczematous. Ulcer is a sort of third stage or more intense degree of the two preceding, often of a croupous or diphtheritic nature, and seen in infants whose mothers have undergone puerperal infection or in those who are septic from any cause. Abscess, a small fluctuating tumor formed in connection with blennorrhea umbilici. Fungus is usually seen in connection with blennorrhea, rendering the latter more difficult to heal. It should be removed by strong astringents, the ligature, etc.

Arteritis umbilicalis is common in the new-born. In four years Fürth saw 308 cases, of which 58 died. The latter were usually poorly developed and weakly children suffering from other maladies. No case was due to erysipelas; indeed, in

cases of abdominal erysipelas the navel was always spared.
The mean age of children with arteritis was ten days. It
never occurred before separation of cord.

Causes: Authorities differ. Bedner said the process began
in a thrombus at the apices of the vessels, the latter being
secondarily affected. In some cases it begins in the vascular
sheath and is due to traction on the cord. Widerhofer holds
the latter view, and, in fact, nearly all authorities regard the
process as beginning in perivascular tissue. Runge was the
first to speak of sepsis as the chief factor. Baginsky saw as a
primary cause propagation of infection from the stump.

Symptoms: Peripheral inflammation or redness; navel fold
occluded by dried pus; the inflamed artery palpable; dilated,
gaping lumina of vessels; fever; abdomen often hard and dis-
tended; profuse hemorrhage often coexists; navel may slough;
peritonitis or erysipelas may occur as complications.

Most cases recover, the pus being evacuated and the arteries
undergoing normal obliteration. Those who die die of hemor-
rhage, gangrene, peritonitis, convulsions, also of meningitis
and joint diseases.

Treatment: Scrupulous cleanliness, expression of pus, tepid
bathing, astringent and antiseptic lotions, or cotton and gen-
eral regimen.

Phlebitis.—The causes are the same as those of arteritis.
The disease may be consecutive to inflammation of perivascu-
lar tissue. It occurs in weakly, diseased children, especially
those whose mothers have puerperal sepsis. The occluding
thrombus may be infected through the gaping mouth of the
vein and infection propagated to the liver. In contradistinc-
tion from arteritis, sepsis and pyemia readily occur. At times
phlebitis is consecutive to some of the diseases of the umbili-
cus, such as blennorrhea. Phlebitis appears at the same date
as does arteritis—viz., after separation of the cord. Pus does
not escape as in arteritis, but there is instead a tumor at the
navel which retains the pus. As a rule the phenomena of
peritonitis are seen. Fever and icterus are present. Ompha-
litis, gangrene, and hemorrhage are frequent complications.
Fürth had 46 fatal cases of phlebitis, and recovery occurs in
the mildest cases only. Death occurs either from severe local
complications or septico-pyemia.

Treatment: Busch reported 4 recoveries from phlebitis
with icterus in which local bleeding and hot poulticing were
used. In severe cases nothing can be done.

Omphalitis begins like the other diseases when the cord separates. It may occur uncomplicated or associated with a variety of other affections—arteritis, phlebitis, gangrene, etc. In general the causes of omphalitis are the same as of inflammation of vessels. The navel is reddened and swollen, while usually the picture is that of peritonitis. Pernicious hemorrhage often coexists. High fever is always present. Omphalitis frequently terminates in abscess. Authors differ greatly as to prognosis. Fürth lost but 2 out of 31 cases. Some have reported a mortality of 50 per cent; others, again, regard omphalitis as almost necessarily fatal. All depends upon the severity of the type of the disease. The treatment is essentially as in arteritis and phlebitis—water dressings, leeches, poultices of lead water, antiseptic lotions.

Von Holst (1884) says that the umbilicus is the commonest and most important port of entry for septic poisons. The other sources are erosions of the buccal mucosa, intrauterine infection, aspiration of infected lochia, etc., from the mother, and possibly from lactation.

Runge (2) (1885) writes the only complete account I have found of the pathology of the navel. He begins with the anatomy and physiology of the cord up to cessation as a fetal structure. Its behavior from time of ligation and division to separation of the stump is as follows: There are two processes, mummification and gangrene. He speaks of the phenomena of inflammatory reaction and separation of the cord from the navel. Runge says that the vein is the last to separate (although others, such as Ahlfeld, state that the arteries are the last to mummify), and describes the normal healing processes of the umbilical wound and the fate of the intra-abdominal portion of the vessels.

The second chapter contains an account of abnormal healing of the navel wound. Runge does not accept the hackneyed division of excoriatis, blennorrhea, ulcus, etc. *It is difficult to distinguish between a healthy and diseased umbilical surface after separation.* The phenomena of erythema and suppuration vary extremely. There is undoubtedly more "reaction" in the separation of a thick than of a thin cord. Much also depends upon the bandaging and presence or absence of traction in the stump. Runge would use the expression "delayed healing" to cover several conditions known as fungus, excoriatis, blennorrhea, etc. The matter to be decided is, "Is the wound infected?" These peculiarities of healing are

not necessarily due to infection. While the stump is still present as a foreign body these peculiarities need not mean anything serious. But when the cord has separated, then peculiarities have a much greater significance. Runge says distinctly that the most severe forms of infection begin before the separation of the cord. Mild degrees of local infection offer nothing peculiar and may heal within normal limits.

Runge would use the term *ulcus umbilici* for intense local infection of any sort—intense redness, altered discharges, fetor, croupous and diphtheritic processes, etc. He gives a chapter on fungus. He divides the treatment into the therapy of delayed healing, mild infection, and umbilical ulcers (a term used because correlative with puerperal ulcer).

Omphalitis.—Runge restricts this term to phlegmonous inflammation about the navel. It is always due to secondary infection of the wound after the cord has fallen. The danger lies in complicating peritonitis or implication of the navel vessels with general sepsis. Rude handling and dressing is undoubtedly a contributing cause. The affection is rare. Runge further describes gangrene of several sorts.

Miller (1888) reports that in the Moscow foundling asylums, with the best precautions, there are yearly from 500 to 900 deaths from pyemic processes. The month of February has shown a mortality from pyemia of 40 per cent of all deaths. This ratio may drop to 25 per cent, or even 15 per cent, during some seasons. There is hardly any doubt that the preponderating cause of this state of affairs is umbilical infection. Most of the sepsis dates from the first week of life. In cases in which death from sepsis takes place in the first three days of life the disease must have had a prenatal origin. About 40 per cent of the cases of sepsis of the first week belong to this category.

The second group, comprising 50 per cent in round numbers, is made up of umbilical infection proper. Miller finds that 9 per cent of umbilical sepsis is associated with gonorrheal ophthalmia, and he believes that there is a gonorrheal pyemia of the new-born. There is a third group of early septic cases due neither to prenatal nor umbilical infection. Here pyemia appears to complicate grave local or general diseases, such as syphilis, sore mouth, etc. This form appears at a relatively late period of life (third to fourth week).

Miller concludes, first, that irrational treatment of the navel and its exposed surface is the most frequent cause of sepsis;

second, that, aside from infection by the navel of pyemia, cases occur due to ulcerative stomatitis, injuries to the head, syphilis, etc.; third, a large number of cases of sepsis date from intra-uterine life.

Cholmogoroff (1889) declares that the umbilical cord of the new-born child is absolutely free from bacteria. Non-pathogenic bacteria, such as the sarcina lutea and bacillus subtilis, develop in the stump, as do the various forms of staphylococcus and the streptococcus pyogenes. According to environment, the fate of the stump is mortification or mummification. By the process multiplication of germs is favored. In mummification we have to deal with two portions of the stump according to their bacterial contents; in the longer segment there are only non-pathogenic bacteria, in the shorter both kinds. Pathogenic bacteria of cord are the same as those of puerperal sepsis. The infection of the cord, however. occurs independently of puerperal fever or gonorrheal ophthalmia.

Eröss (1891) had noticed that during the first ten days most of the new-born showed a rise of temperature. He has studied 1,000 cases within eighteen months. In at least two-thirds of all cases the drying and separation of the cord and the healing of the wound run an abnormal course—literally in 68 per cent,

These abnormal phenomena include moist gangrene in 14.7 per cent, shreddy disintegration in 18.2 per cent, partial separation with persistence of part of the stump in 22.4 per cent. suppuration after separation in 10.9 per cent, ulcer in 1.7 per cent, while there were 2 cases of gangrene of umbilicus in the 1,000 children. Gangrene of the cord usually set in on the second, third, or fourth day of life. The condition was not progressive, and appeared to be arrested by antiseptic measures and frequently changing the dressings. Of the 147 cases of putrefaction of the cord, 81 had fever. The degree of fever varied greatly in duration, intensity, evenness, etc. Of the 81, 49 had continual fever and 3 died, 2 of arteritis umbilicalis and 1 of peritonitis. Thirty-two left the hospital with fever, and some developed furuncles. Sixty-six cases of gangrene of the cord had no fever. Of the fever cases, 32, as has been said, appeared to have general sepsis, yet only 3 died.

Length of stump: In 412 cases a short stump (2 to 3 centimetres) and in 544 a longer (5 to 6 centimetres) was left. Of the 182 children with shreddy disintegration, 55 (30 per cent) had fever. In 10 of the number there was probably some general infection. No deaths. Of the 224 cases with imperfect

separation, 55 (25 per cent) had fever and 8 had probably some
general infection. No deaths. Of the 109 cases of suppura-
tion, 24, or 22 per cent, had fever, and in 6 there was probably
general sepsis. Of 17 cases of ulcus umbilici, 3 had fever, 1
probably septic. In the 2 cases of gangrene of the umbilicus
it was not in any way dependent on gangrene of the cord.
Fever was not present. Both cases died.

Therefore, of 1,000 cases, 57 had fever, high and constant and
persistent enough to imply general intoxication in connection
with other phenomena. As a general truth he states that *fever
is the safest. and often the sole, symptom of infection.*

Of the 680 cases that showed some rise of temperature, in 220
only was the responsibility fixed upon the navel. Eröss calls
attention to the general mortality of infants from all causes
during the first week of life.

Herzog (1891) gives the views of Robin and his successors
upon retraction. Thereby is explained the adhesion of the
umbilical arteries to the lower margin of the umbilical ring.
The vein, however, which should also have retracted, does not
adhere to the ring. Herzog explains the adhesion of arteries
to the ring by transformation of periarterial embryonal tissue
to fibrous tissue after birth. Very soon after birth the section
of the vessels in the immediate neighborhood of the ring is
known to become thin. While this thinning affects the arte-
ries for only 2 centimetres from the navel, the vein is found
thinner even as far as the liver.

Herzog is unable to accept retraction. He has found the
artery soon after birth unaffected beyond the 2 centimetres
referred to above, and filled with a clot. The myxomatous
adventitia is seen in the midst of transformation to connective
tissue, with formation of new blood vessels. Granulation tis-
sue forms in the lumen and displaces the blood clot, and also
invades and displaces the muscular coat. The latter, however,
does not at first disappear save in the 2-centimetre length of
artery already referred to. The two arteries are seen in a cut
in different stages of retrograde change. One is yet filled with
a blood coagulum, the other contains succulent granulation
tissue. The remaining section of the arteries gradually under-
goes the same changes.

Retrograde changes in the vein are the opposite of those in
the arteries. The vein retains its musculature longest in the
neighborhood of the navel and succumbs first in the region of
the liver. These changes disprove the notion of retraction, he

thinks. The process of obliteration is directly dependent upon the degree of distension of the vessels.

Deichmann (1891) saw a child, aged 9 months, with a large abscess below the right axilla. It was healthy at birth, but the cord was torn accidentally shortly after, the midwife checking the hemorrhage with cotton. The cord separated normally, a little serum oozing for some time from the wound, which healed normally. After a long period of latency there were evidences of severe pyogenic infection of slow evolution. A series of subcutaneous metastatic abscesses formed, all upon the same side of the body. The liver and other vital organs escaped. The child ultimately recovered. Deichmann states that there can be hardly any doubt that infection occurred at the umbilicus, despite the apparent absence of local reaction.

Gmelin (1892) says that ever since 1767 there has been a large mortality in the foals of the Marbach stud from pyemic joint diseases. These foals were healthy at birth, as a rule. The source of infection was never surmised until after the introduction of listerism, when the diminished death rate from pyemia was ascribed by Bollinger to asepsis of the navel incidental to general asepsis.

Even in a state of nature there is a natural predisposition to umbilical infection, because necrotic changes occur in the cord, especially in the urachus, because the umbilical vessels have to be occluded by thrombi, and, finally, because of the proximity of the peritoneum.

With regard to treatment, there is none aside from prophylaxis. Gmelin never saw but two foals recover from pyemia. Such foals never amount to anything afterward. Epidemics of umbilical sepsis readily occur among foals.

General management: When the colt is born the cord is washed antiseptically. If the mare is standing the foal is not allowed to touch the floor. The cord is cut after pulsation stops, the foal cast on a bed, and all hair which might touch the cord is cut away. The cord and abdomen are washed with antiseptics at intervals. Four or five days after birth cracks appear at the future line of demarkation. Without waiting for natural separation, the cord is cut where these cracks appear and a zinc-sublimate-gelatin dressing is applied to the stump. The cut surface soon retracts, leaving a central opening which is readily infected with pus. This cavity is irrigated every morning until it fills up with granulations.

Ehrendorfer (1892) discusses every possible method in which

the new-born may become infected.   Of these the navel is by
far the most important point for the entry of germs.   Infection
of the navel is a disease of public practice.

From May 1, 1888, to May 1, 1892, at the Innsbruck Mater-
nity, 1,764 children were born, of which 95 died, with 81
autopsies.   Of these latter 16 were dependent upon umbilical
infection.   There were 9 cases of arteritis, 4 of phlebitis,
and 3 mixed cases.   Umbilical infection was the second high-
est cause of mortality of the new-born, atelectasis coming
first with 19.   Ehrendorfer agrees with most authorities in
finding *arteritis the most common form of infection and
pneumonia the most frequent complication.   The tendency
to infection appears to be greater in premature children.*
Infection does not always ensue at once.   Ehrendorfer men-
tions a case of incoercible hemorrhage which ended fatally.
The arteries were found retracted, the vein filled with pus.
The source of the blood need not be the umbilical arteries, but
may come from the vascular circle beneath the umbilical wound
through ulceration of the latter.   Cases of umbilical infection
may occur in groups.

Errors in diagnosis are very common.   Of the 16 cases of
sepsis the antemortem diagnosis was debility in 6 cases, sep-
sis 3, erysipelas 2, pneumonia 2, enteritis 1, etc.

The stump begins to dry from the periphery.   The amniotic
sheath is separated from the skin at a point where there is a
vascular ring.   The jelly dries, the vessels contract and also
dry.   The dried cord falls without any inflammatory reaction
or pus.   The exposed surfaces heal at the end of the second
week.   Infection spreads along the perivascular tissues.   Rec-
ognition of infection is by no means easy.   The stump should
be studied carefully and *the rectal temperature* taken—this
may be the sole symptom.

Morris (1893) used formerly to see a good deal of erysipelas
in the new-born, due to midwives dressing the cord with tallow
and goose-grease.   If the discharge from a cord becomes foul,
or if the dressings get saturated with urine or fecal fluids, the
venous thrombi often liquefy and break down.   Besides ery-
sipelas, phlebitis, and sepsis, inflammation may travel along
the cellular tissue of the vein and cause obstructive jaundice.
Suction upon the umbilical vein during inspiration may favor
the penetration of septic matter.

Cobilovici (1893) states that, according to Paquez, the chief
pathogenic germs in umbilical pathology are white staphylo-

cocci and the bacillus coli. He found the serum which oozes from the line or groove of demarkation was sterile after five days' aseptic dressing of the stump.

Winckel (1893) says that both arteries are involved as a rule in arteritis.

A consideration of 362 cases by Grosz (1) (1894) showed normal healing of the navel in 21 per cent; a greater or lesser degree of putrescence of the stump in 57 per cent; shreddy falling away in 11 per cent; ulceration in 14 per cent; fungous granulation in 18 per cent; and a pronounced suppuration of the proximal end in five instances.

Ahlfeld (1) (1894) states emphatically that asepsis of the stump is a failure. *Suppuration of the umbilical cord cannot be prevented.* Staphylococci are always present. He mentions periumbilical pemphigus (Trautenroth) as a frequent occurrence and due to the action of the pyogenic cocci of the navel. Complete exclusion of air as first taught by Dohrn is hard to carry out, but is undoubtedly efficacious. There is a relationship between fungous granulations, marked suppuration, and hemorrhages. Detaching dry dressings may start hemorrhage. Persistence of the arteries in the shape of a penis-like body demands amputation and cautery. This persistence favors suppuration. Periumbilical pemphigus always shows the staphylococcus pyogenes aureus in the serum. It begins as miliary vesicles on the third or fourth day in the region where maceration from the ordinary bandage often occurs.

Arteritis and phlebitis are pure streptococcus diseases, which at first extend along the outside of the vessels, then penetrate the walls and eventually cause local and metastatic lesions. The primary lesions are often overlooked. There may be swelling in the course of the vessels, with slight edema of the legs, followed by sepsis or pyemia. In sepsis the prognosis is absolutely hopeless, but in pyemia there may be recovery even after many abscesses have formed. Traumatic erysipelas has a grave prognosis and is sometimes prone to become gangrenous. Hemorrhage often goes with sepsis and is a bad symptom, showing that the blood cannot form thrombi. In trismus nascentium the tetanus bacillus has been found. Ahlfeld does not mention antitoxin.

Doktor (1894). The new-born child has good resisting powers, but the navel is its Achilles heel. The recent navel wound is like nutrient gelatin as a culture medium; the sheath is less suitable for cultures. A few hours after birth the amniotic

sheath dries, and as a result the bacteria cannot thrive upon it nor penetrate it to gain the jelly. From this time on the wound is well protected until the cord separates. The slight but constant irritation of the stump is the cause of over-granulation and fungus. Doktor thereby divides umbilical pathology into (1) infections and (2) disturbed healing process—granulations, fungus, bleeding, etc.

Doktor took up the work as left by Eröss. His first material embraced 420 new-born children. Midwives were not allowed to handle the cord; lint was no longer oiled; after bathing, the navel was dried with clean wadding. The antiseptic used was sublimate lotion, 1 per cent. Under this management 16 per cent had fever due to navel infection. Doktor did not like this result, and decided that infection took effect only after separation and was due to decomposition of cord. This could have been due to but one agency—viz., the bath. A cord already nearly dry may on the fourth or fifth day begin to putrefy. In such a case amputate at once.

Doktor took a new material of 462 cases. He left the stump 8 to 10 centimetres long in clean lint for thirty-six hours. The stump was again ligated and cut off one-half to one centimetre long and again covered with lint. Dressings were not changed until separation was due, the child being still bathed daily, the wound dressed with clean cotton. Under this management ten per cent had fever due to navel infection.

A third series of 229 children was now studied. Instead of wrapping the stump in lint, cotton was used freely. Management as before, with omission of the bath; dressings changed on the third day, and then on every second day until separation. In this series he had but 6 per cent of fever. The result was ascribed to omission of the bath. But the large amount of cotton used kept out much air and soon putrefaction occurred, while at times cords would not separate until the eighth or ninth day.

In his fourth series Doktor cut the cord loose, leaving a stump of but one centimetre long. "The fresh cord cannot be cut absolutely short (cut off) just after delivery." The short stump he covered with pledgets of lint, changing the dressings first on the third day and then each second day until separation. Result, only 3.46 per cent of fever from navel infection.

Grosz (2) (1895). His material embraced 444 cases, and in only about one-fifth was the course entirely normal. In 250

cases sloughing, in 49 shreddy decomposition, in 19 umbilical ulcer, 21 fungus, marked suppuration in 5, and in 4 prolonged mummification. After separation more or less purulent or sero-purulent discharge. But 26 cases had fever, and in 8 of these the navel healed normally; the fever usually occurred at the time of separation. There was but a single case of fatal sepsis. In this the cord came away on the seventh day and there was but a slight degree of putrefaction. He leaves a 5-6 centimetre stump, dressed with dry lint changed twice daily.

Hermes (1895) has investigated the morbidity at the Danzig Clinic in 100 children. Management (taken from Prussian Midwife's Book): Cord tied four fingers' breadth from abdomen with antiseptic ligatures. Hermes finds the mortality at Danzig is about 2.6 per cent.

Bouffe de St. Blaise (1895) says concerning sepsis of the cord: The necessity for antiseptic ligature is shown by the results of omission. He relates the history of an epidemic of 7 cases of umbilical erysipelas with 3 deaths, the cords having all been tied with ligature from the same infected skein. Many similar cases are found in Cobilovici's thesis. On lymphatic infection he cites Runge, Roullard, Baginsky, Achal.

Ashby and Wright (1896) believe that arteritis and phlebitis must be almost unknown in England, as no literature exists upon the subject. Morris (1893) is not in accord with them.

Cohn (1896) teaches that in septic conditions of the new-born there is originally infection of the tissues surrounding the vessels of the cord, rapidly followed by suppuration within the vessels. Pyemia may readily result. These conditions are still frequent, despite prophylaxis. He first relates a case of umbilical phlebitis with discharge of pus externally, metastatic abscess of forearm, and recovery. On the eleventh day of life, the umbilical wound still suppurating, the phlegmon appeared; the navel suppuration continued for seven weeks. All authors agree that umbilical phlebitis is almost necessarily fatal, hence the importance of this case.

Cohn gives a second case of umbilical phlebitis complicated with phlegmonous erysipelas, suppurative peritonitis, and death. Here, although the navel wound had healed, autopsy revealed that phlebitis was the first step in the infection. Everything in connection with disturbed healing process is of infectious nature, and, since the morbidity of cord healing is so great, there is a corresponding interest in prophylaxis. Two

kinds of infection of the stump are possible: 1, from pyogenic bacteria, which may cause a variety of local lesions, as well as septico-pyemia; 2, from saprophytes. These latter cause putrefaction of the cord. While we may keep pyogenic germs away by strictest asepsis, this does not avail against saprophytes which are present in the air. With saprophytes we may have air-infection. Sapremia follows from absorption of putrid material, and the great morbidity found by Eröss and others (something like 68 per cent) is largely made up of sapremic fever. Beyond this, however, Cholmogoroff showed that the pyogenic cocci flourished specially in the putrefying cord, so that the stump of the cord favors both kinds of infection and their general effects upon the economy as a whole. Cohn concludes that we must study how to keep away all pathogenic germs such as reach the cord by contact only, while at the same time we must prevent putrefaction of the stump. Contact-infection is of course controlled by asepsis. Air-infection: For putrefaction to occur the following factors are requisite: (a) an animal substratum, (b) a certain mean temperature, (c) a certain degree of moisture, (d) presence of putrefaction germs.

(a) The organized substratum. To eliminate this factor, make the stump as short as possible. The shorter the stump the less the danger. With regard to keeping away the germs of putrefaction, we may take advantage of the fact that the cord is sterile at birth and apply occlusive dressings. The permanent bandage, however admirable in theory, is not a success in practice, at least as far as a routine procedure, although good individual results have been obtained. Another plan is to destroy putrefaction bacteria by antiseptics; but if conditions for putrefaction are favorable these agencies are unable to prevent it. To exclude moisture Cohn gives Runge's experiments in detail on detached cords, also some of his own with sugar, alum-tannin, etc. He does not appear to arrive at any definite conclusions save that the daily bath is contraindicated.

Lambert (1897) had 5 cases of death from sepsis in a year with a number of cases of mild, non-fatal sepsis. His whole material covered 169 births (deducting stillbirths, 147 births). The word sepsis entirely covers the pathology of the umbilicus. The symptoms may be only local or general: fungus, excessive granulation, cellulitis, pus ; perhaps abscesses and gangrene. Phlebitis and arteritis are very fatal, but may give

no local signs. The general symptoms of sepsis include fever, loss of weight, jaundice, eruptions, abscesses, thrombi, etc.

Of 147 cases, there were 95 of fever and 47 of granulation after separation of cord. Nearly every case admitted in July, August, and September, 1896, had fever of 100° F. or more. There were 54 cases of initial temperature, and 61 cases had jaundice. The five deaths were as follows—all had initial temperature and loss of weight:

1. Phlebitis. Umbilicus appeared normal. Metastatic abscesses and thrombi. Staphylococci. 2. Arteritis and suppuration. Staphylococci. 3. Ibid. No cultures made. 4. Probable arteriophlebitis. No cultures. 5. Pus in umbilicus. No autopsy.

Audebert (1897) gives the credit to Dubois and Billard for showing that the umbilical wound might become infected. The button left by the separation is rich in lymphatics and apt to invite bacterial penetration from infected hands or dressings.

Dorland (1897) has twice seen a condition undescribed in text books, viz.: failure to form a normal line of demarkation, the cord persisting until artificially removed. The condition appears to be a fibroid degeneration without mummification, which latter phenomenon occurs only toward the distal end. In the two cases separation had not occurred on the ninth and sixteenth days respectively. He has since learned of another case in which the cord persisted for eight weeks. In one of the author's two cases the child died of sepsis, the amputation having been undertaken at too late a date.

According to Kockel (1898), a few hours after birth a leucocytosis infiltration appears at the base of the cord, limited to its junction with the navel. At first it affects the outer layers and later extends inward. Its presence is absolute evidence that the child has lived, even when other signs are negative. Kockel furnishes indications to determine the duration of life by the degree of infiltration.

Fischl (1898) states that infection of the navel may occur in two ways: first, along the perivascular lymphatics of the cord (eventually reaching the interior of the arteries), and, second, it may directly enter the divided vessels.

BRIEF SYNOPSIS OF PATHOLOGY, ETC.

Among savage peoples Ploss shows that umbilical hernia is

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frequent. Gmelin states the severity and frequency of infection in foals and the improvement under clean handling. Stutz, Herzog, and others describe the rationale of normal separation in mankind. Kockel, being the most recent contributor, especially discusses the microscopical and medico-legal aspects. Authorities differ with regard to normal separation in several essential particulars. Most of them say that mummification is the natural, putrefaction the abnormal, termination ; Runge, however, basing his opinion upon experiments, regards these terminations as equally natural or abnormal, since they depend wholly upon atmospheric and other factors. Putrefaction is not necessarily progressive, and may, according to Lambert, be arrested by exposing the cord to the air for twenty-four hours; while, conversely, Doktor says that a cord in the act of mummifying may all at once mortify.

It is usually stated that the act of separation and the act of mummification are coterminous—in fact, two phases of the same process ; yet there are numerous vagaries in separation as well as in mummification. Separation may be imperfect, more or less of the cord persisting for a longer or shorter time. Runge says that the vein is the last part of the cord to separate, while Ahlfeld[3] states that the arteries are the last to mummify. The surface after separation is very rich in lymphatics.

The process of separation is conceded to be quasi-inflammatory. Runge and Tarnier state that the thicker the cord the greater the reaction, while according to Zweifel thick cords separate more quickly than thin ones.

Delayed Healing.—Before reaching the actual pathology of healing we must, according to Runge and others, carefully distinguish between merely tardy healing process and disease. This distinction is quite overlooked by most writers. Some redness and discharge may be due purely to poor bandaging, to the " slight but constant irritation of the stump," or to traction on the cord.

It is well here, however, to carefully separate the period of separation from the period of healing after separation. Delayed separation, according to many writers, need not imply a poor result, as healing may be further advanced in these cases than when the cord separates early. In general Runge insists that the term " delayed healing " covers everything not included under infection. The more recent writers insist, with Cohn, that " everything connected with a disturbed healing process

is of infectious nature," or, as Lambert puts it, " the word sepsis entirely covers the pathology of the navel."

Abnormal Healing.—Grosz states that four-fifths of all cord healing is abnormal. Others place this proportion as smaller by little or much. Eröss, in his analysis of " cord morbidity," makes the abnormalities before separation to consist of putrefaction of cord, shreddy disintegration, and imperfect separation with persistence of part of the cord ; while the anomalies after separation consist of suppuration, ulcer, and gangrene. These processes are essentially local and uncomplicated—gangrene of the navel exceptionally occurring by continuity from the putrefying cord. Putrefaction, according to Cohn, is always due to air-infection, and hence has nothing in common with forms of infection by contact. This susceptibility of the cord to air-borne saprophytes and contact-borne pathogenic germs is Cohn's keynote of the whole situation. Air is supposed to be essential to mummification, yet under certain atmospheric conditions the air is also essential in causing putrefaction. By hermetically protecting the cord putrefactive germs may be excluded with the air, yet the beneficent action of pure air on mummification is forfeited and delayed drying is then the rule. The putrefying cord, while it may not cause any systemic disturbance, is not only capable of causing sapremic fever by absorption, but forms an excellent nidus for the breeding of the pathogenic varieties of bacteria. As we have no means of controlling the atmospheric conditions which favor putrefaction, we have several strong reasons for wishing all of Wharton's gelatin removed. With regard to persistence of part of the cord, Eröss states that it is extremely common, and Ahlfeld describes at some length the " penis-like body " which occasionally remains *in situ.* Dorland had a case of this sort die of sepsis. All authors would agree in advising secondary amputation for persistence.

Local Infection or Local " Sepsis."—The term " umbilical sepsis " usually refers to local processes only, simply to the action of the pyogenic cocci upon the umbilical wound. The fever described extensively by Eröss, Doktor, Rösing, and Keilmann, which occurs during the first few days of life, is not septic but sapremic. Putrefaction and sapremia are phenomena which occur before separation; local " sepsis," with occasional phlegmon, erysipelas, arteritis, pyemia, etc., are phenomena which occur after separation. While nearly all authorities make infection a condition of the post-separative

period. Runge states expressly that the very worst cases of sepsis date from the period before separation. This statement is not in harmony with the general opinion. Most writers state that the cord is sterile at birth and that its sheath prevents it from becoming infected. On the other hand, it is commonly stated that the navel after separation is a perfect culture bed for bacteria. According to Cobilovici, if the stump is treated aseptically during the five days or so which precede separation, the discharge from the navel will be found sterile.

Generally speaking, the bacteria which are pathogenic in navel infection are the same which are prominent in puerperal infection. The golden and white staphylococcus, the streptococcus pyogenes, and bacillus coli are best known. The tetanus bacillus, streptococcus erysipelatis, and other forms occasionally figure in epidemics, while certain saprophytes have been described in connection with putrefaction and sapremia.

These forms cause the various local processes, such as ulcus umbilici, periumbilical pemphigus, periumbilical phlegmon, lymphangitis, etc. Local infection is greatly favored by the newly formed recess of the umbilicus and the difficulty in cleanliness and drainage.

General Disturbance, Systemic Reaction, Sapremia, Arteritis, Septico-pyemia, etc.—According to Cohn the morbidity, principally consisting of fever, which is so common in foundling asylums in the first few days, is sapremia due to putrefaction of the cord; and this view is borne out by the fact that methods which prevent putrefaction do away with the fever.

Very different are the conditions which result from actual penetration of bacteria into the body. The germs may enter by the lymphatics of the newly forming navel, by the glandulæ of the skin (Escherich), or even directly by the open surfaces of the vessels. They may give rise to no local disturbance whatever, or may destroy by septico-pyemia; they may cause arteritis or phlebitis, the former relatively common and benign (with numerous exceptions), while the latter is rare and malignant (with a few recorded exceptions). It is now generally admitted that the perivascular tissue is first affected and that gradually the bacteria gain the interior of the vessels. Fever may be the sole symptom of constitutional sepsis, the local condition telling nothing or indicating a healthy process. Recognition of infection is therefore difficult, either at the

third day or at the tenth. The statistics of Miller, Epstein, Runge, Ehrendorfer, and others show that several thousand children die annually in Europe from septico-pyemia following these lesions, the tendency to infection being greater in premature children. On the other hand, little appears to be known of these affections in England, probably owing to lack of careful observations. Their occurrence in the United States has been studied by Prudden and Lambert, both of whom have described groups of cases in foundling asylums. Most of our knowledge of umbilical sepsis is drawn from the experience of a dozen or more superintendents of foundling services.

TREATMENT.

Stripping.—The Chinese strip the cord (Ploss). Caseaux (1868) directs that in thick cords, to prevent putrefaction, the enveloping membrane be pricked and the gelatin expelled by stripping. He states that " authors properly recommend this method." The stump is wrapped in a linen compress. Goodell (1879) likes a modification of King's method. He squeezes out blood and jelly, and nicks the sheath to give further egress to the latter if need be. After allowing the vessels to collapse the cord is stripped again. Since adopting this method he had over 200 cases in an institution, without a single accident. Stripping is rather generally mentioned in the treatment of thick cords. Credé and Webber show experimentally, by injection through a piece of cord, that stripping has little effect in rendering the ligature tighter and safer.

Antisepsis.—Weiss (1879) discusses infectious hemorrhage (in septic processes, etc.). He seeks, by scrupulous cleanliness and disinfection, to prevent infection of the child. In maternities and foundling asylums he emphatically recommends that the navel be packed with antiseptic dressings. This should also be done in private practice during epidemics. Weiss is one of the earliest, if not the earliest, to suggest antisepsis. Dohrn, in 1880, wrote that every gynecologist " now " knows the disadvantages of the traditional methods of treating the cord. Leaving a stump accessible to air and dressed twice daily readily paves the way for infection. He puts the newborn on a table and washes the stump and its environment with two and a half per cent carbolic lotion. The cord is again tied with antiseptic tape and cut close off above the ligature. A pad of carbolized cotton is then applied and left seven days without exposure to air or renewal. On the seventh day the

cord is found to be nearly or quite detached. The permanent dressing is made with adhesive plaster. The wound secretion is found to be less than by other methods.

Sänger (1880) would think aseptic navel dressings necessary if epidemics of children's diseases or puerperal sepsis of mothers were prevalent. The stump should be 3 centimetres long, dressed with salicylic cotton and adhesive plaster. He would leave this undisturbed until time for the cord to separate, and would then spray the stump with carbolic acid water and apply a second dressing until the wound is healed.

Runge (3) (1881) says that the "important steps in the prevention of navel infections are: 1, all possible aids to favor mummification of the stump of the cord, which, especially in cords rich in jelly, should be cut off as short as possible at the time of ligation (beyond the ligature); and, 2, rigid cleanliness from the very earliest contact with the cord until complete closure (healing) of the navel wound." He goes on to advocate dressings wet in three per cent carbolic acid solution and care in bathing, and insists that the child be cared for each time by the *Hebamme* before the mother is touched.

Runge (2), writing in 1885, has a considerable section on prophylaxis of disease of the umbilical vessels, viz., prevent putrefaction of the cord by dry dressings often changed and keeping the child dry; no oil or greased lint on cord of new-born. He approves of Credé's management at Leipzig—ordinary absorbent cotton, changed after each daily bath; the same after separation, which, with his salicylic-starch powder, make up his therapeutic resources.

With regard to prevention of umbilical infection, Miller (1888), drawing conclusions from a very large service (see p. 24), insists that the midwife must be taught asepsis of the cord. Her hands, the ligature and whatever else touches it, must be treated with antiseptics. After washing the cord stump in an antiseptic lotion, it should be powdered well with a mixture of boric acid and starch (1: 3), and then wrapped in absorbent cotton with light bandaging upon the left side of the abdomen. All fats are expressly contraindicated. An experiment may be performed by any one which is conclusive. A piece of cord is exposed to the air and sunlight, but one end is dressed with an oiled rag. In forty-eight hours the exposed end is wholly dry while the other end is putrid. Since Runge's ideas of antisepsis have been carried out in Moscow complications have seldom been seen. An initial bath is given, the powdering and

wrapping in cotton are begun, dressings changed morning and night until separation.

When foundlings are received some time has elapsed since birth and the cord has often already begun to putrefy. In such cases the putrid part of the stump is always amputated, and the rest disinfected with carbolic lotion (two or three per cent), dried with cotton, and strewed with a mixture of gypsum, talc, and boric acid. If pus appear either before or after separation, the same management is resorted to, with the addition of touching with a two per cent nitrate of silver solution. If the suppuration is excessive and omphalitis has begun, iodoform is dusted on. Miller is satisfied that by these measures he has often prevented omphalitis, arteritis, and sepsis. In preantiseptic days 53 per cent of omphalitis was followed by pyemia, and 16 per cent of all deaths were from the same disease; whereas in 1887 the mortality from pyemia was but 6 per cent.

Eröss (1891), in his careful study of 1,000 cases, by means of a table of comparative management shows that the lowest percentage of putrefaction was furnished by a short stump (2 to 3 centimetres), linen tape ligature, and a dry lint dressing.

Ehrendorfer (1892) thinks that the bath water must be aseptic and there should be no tugging at the cord during the bath. Caustics producing sloughs, and greasy dressings, must be avoided. If the healing is slow, carbolic or boric lotions are indicated. Phlegmons must be poulticed or warm baths given. Contact of substances with the stump is bad, and swaddling clothes or dressings should be forbidden. Premature opening of the amniotic sheath should be prevented by dressing lightly with Epstein's bandage. The author uses dermatol and starch in equal parts as a powder. He further advocates *two* daily baths, believing that the water may wash away matter which might infect, and that it also tends to prevent local reaction. The bath water should be boiled, and if there is reason to fear infection the umbilical wound is touched after the bath with two per cent silver nitrate solution. If the stump becomes gangrenous, slit up the amniotic sheath, but not the decomposing jelly, and dress with powdered acetate of aluminum.

Morris (1893) says the treatment should be simple, dry dressings and a minimum of interference. If pus should form it must be removed by frequent irrigation.

Ribemont-Dessaignes and Lepage (1894) teach that the best dressing for desiccation and rapid fall is a little dry aseptic

wadding. The use of the roller is questionable. It ought to be tightly applied, yet, if it is, it compresses the abdominal viscera. The authors also recommend the glycerin treatment.

Doktor (1894) believes that the bandage once applied should not be changed unless for cause

Rösing (1894) gives a record of a study undertaken in Prof. Kaltenbach's clinic at Halle, 1893–1894. The new-born had the cord ligated and divided, under strict antiseptic precautions, eight or ten minutes after birth; the stump 6 to 8 centimetres long. The midwife wrapped the cord in cotton saturated with olive oil. The child was bathed daily, the stump thenceforth dressed with dry cotton, which was not disturbed during the bath. Of the 100 children whose temperature was carefully measured, 6 (6 per cent) probably had umbilical infection. There were no fatalities from this infection. Instead of the 68 per cent of normal healing reported by Eröss, Rösing got but 21 per cent; this abnormal course includes granulation, pus, fetor, hemorrhage, etc.

The method in use in the second Budapest clinic by Grosz (2) (1895) is as follows: A stump of 5 to 6 centimetres is left, wrapped in sterile lint, turned to the left, secured with a roller. The dressing is changed twice daily and whenever wet with urine. When the cord comes away dry cotton is used.

Schwab (1896) advises no other dressing than absorbent cotton kept out of reach of wetting by urine.

Lambert's regular management (1897) is as follows: The cord is stripped after pulsation has ceased. It is tied one and one-half to two inches from the navel, then brushed with a bichloride lotion; dusting powders with sterile cotton or gauze applied, and not disturbed unless necessary. No baths. Lambert concludes that access of air favors drying. A piece of cord which has begun to putrefy may still become dry and brittle if left for twenty-four hours in the air. Stearate of zinc is an adequate dressing and is said to admit the air.

Audebert (1897). Wipe the umbilical region and cord with antiseptic cotton. Have a pad with a hole for the cord, and superimpose another pad. Renew the dry dressing whenever the cord is soiled by urine, etc. As the furrow deepens dressings are to be renewed more frequently. Use antiseptic powders like aristol (remembering that iodoform poisoning readily occurs). No baths.

After the fall of the cord the navel should be found cicatrized, but as a matter of fact cicatrization may be only partial. Sup-

puration or slight hemorrhage may be present. No wet dressings. Use salol, gauze, or aristol.

DRESSINGS.

No Dressing.—King has taught omission of dressings since 1867. Goodell is quoted (1879) as advocating the omission of dressings. Craigen (1885) abstains from all dressings of the stump, which "should be allowed to dangle."

Pierson (1898) for fifteen years has followed Goodell's open-air method, although he leaves but one-half inch of the stump. He recalls Pallen's rubber thumb-stall, which protected from irritation and prevented fetor. No matter how carefully the cord may be tied, fatal hemorrhage occasionally results.

Wet Dressings.—Zweifel (1889) advises disinfection of the stump with antiseptic washes (sublimate, zinc chloride) and dressing with borated vaselin.

Allen (1894) lets the stump protrude through a pad of sterilized gauze, over which is placed another pad soaked in *glycerin*. This substance promotes desiccation and the cord often falls in three days. Fresh glycerin is added twice daily. Repeated examination of the cast-off stump has failed to show any bacterial life. If ulceration or infection should occur, he would use hydrogen peroxide and the nitrate of silver stick.

Schliep (1895) claims that pencilling the cord twice a day with a two per cent solution of nitrate of silver will lead to mummification more rapidly than contact with air.

Fothergill (1896) advises dressing with wet antiseptic dressings.

Rochon (1897) objects to a dry dressing because it produces rapid desiccation of the cord, danger of premature separation, and hemorrhage. A moist dressing delays the fall of the cord and may leave an imperfect cicatrix. He advocates the use of a piece of absorbent cotton soaked in a 1 : 200 solution of picric acid to prevent decomposition and assist cicatrization. A single dressing may suffice, but it is best to repeat it on the second or third day.

Von Budberg (1898) has used *alcohol* in 200 poor and dirty children, and has not had a drop of pus. Alcohol is hygroscopic, adipolytic, and antiseptic. Technique: One initial general bath. The stump rendered bloodless by compression. Absorbent cotton saturated with alcohol applied under a simple compress and roller, and changed once or twice a day until the cord drops. He still uses the general daily bath and sees

no bad results under the alcoholic management. When cord is unusually moist, absolute alcohol is used. The skin is not irritated, and no pain is felt unless alcohol gets upon the genitals.

Powders.—In Oceanica dry chalk is used by some tribes; the Japanese use powdered gall apples; and some Australian natives use fine wood charcoal, a perfect aseptic and absorbent dressing (Ploss).

Runge (1885) likes salicylic acid best as dressing.

Risch (1889) dresses his little stump with a burnt rag or powdered charcoal.

Stuart (1891) has used bismuth for a number of years. He passes the cord through a perforated pad of lint, having "buried" it in the powder. The dressing need be applied but once, and the cord dries immediately. As the dressing is permanent, mothers and nurses cannot meddle with it. The cord drops sooner than by any other method—for small cords three days, larger five or six days, never more. "One hundred per cent good results."

Frühwald (1891) deplores the neglect of antisepsis of the navel. He suggests a systematic plan, including disinfection of the hands of the midwife or nurse and asepsis of bath water, linen, and air of dwelling. If the mother has puerperal sepsis she should be isolated. To promote drying of cord, Frühwald advises 5 per cent boric or 2 per cent salicylic acid. The cord is then lightly enveloped in antiseptic gauze.

Schliep (1895) states that Aly and Lomer, of Hamburg, recommend sprinkling sugar on the stump. Schliep would prefer the cautery and charcoal. Olshausen is recommending charcoal.

According to investigations by Weinstein (1895), the keeping dry of the navel stump is best secured (in 98 per cent of cases) by the use of charcoal made from straw (*Strohkohle*). Dry wadding is to be recommended as a dressing. Since baths delay the drying process, they are to be avoided in the first days.

J. Lewis Smith (1896) gives an account of a series of umbilical infections. These infections might be prevented in a large proportion of cases by proper antiseptic dressing of the navel. Boric acid and borated cotton is entirely too feeble. He would disinfect with sublimate (gr. ii. : Oii.).

According to Jacobi, on the twelfth to the fifteenth day

cicatrization is complete. The "judicial-medical" opinion that the drying of the stump indicates that the child has lived is archaic and incorrect. In the treatment of the stump care must be taken to keep it dry by the use of antiseptic powder.

The "American Text Book of Obstetrics" (1896) recommends the use of antiseptic lotions (1 : 1000 bichloride), followed by powdered boric acid and borated gauze.

E. P. Davis (1896) says the navel should be cleaned with bichloride lotion (1 : 5000), powdered with salicylic acid and starch (1 : 5), and wrapped in borated cotton.

Dorland (2) (1896) passes the cord through a piece of salicylic cotton with dusting powder of salicylic acid one part, powdered starch four parts. He also cites Allen's method.

Dakin (1897) believes that the stump should be passed through a square of antiseptic gauze and covered with one or two teaspoonfuls of boracic acid powder, and be turned upward under a roller.

Wentz (1897) says the wet dressings of the cord are lard, sweet oil, fresh unsalted butter, and petrolatum; the dry dressings are starch, iodoform, boric acid, salicylic acid, powdered acetanilid, bismuth, chalk, talcum, lycopodium, calomel, and others, used separately or in combination. He prefers calomel and boracic acid (1 : 7). The cord falls off in from nine to sixteen days by this method. Taylor and Wells (1898) use dry antiseptic powder.

Horn (1899) relates his experience with Strumpf's newly recommended use of clay as a dressing. Clay is both aseptic and antiseptic and has a great affinity for moisture. It must be used in large amounts. Method: The child receives one good bath at birth; then after the cord is dried a cotton compress is thickly covered with powdered clay. The clay is renewed twice daily, and after the stump has fallen it is still applied for a day or two. Aside from the navel the child is bathed daily. This dressing requires a longer time for healing than do the older methods, but in 160 cases the results have been otherwise perfect. If the cotton adheres to the cord no attempt to detach it should be made. The treatment is "simple, safe, and cheap."

Dry Gauze and Cotton Dressings.—Lusk (1885) says the cord should be wrapped in absorbent cotton, a plan "first recommended" by Dr. Babcock, of Indiana (1883), and since warmly recommended by Credé and Weber (1884). King

(1867–1895) uses dry cotton. Chevalier (1888) found that under vaselin compresses the cord fell in one hundred and twenty-four hours; with dry dressing it fell in ninety-six hours. Epstein's (1888) study of 1,816 children in the foundling asylum at Prague showed that of this number 116 died, 36 (or 31 per cent) of sepsis. In the early days of antiseptics the stump and environment was treated with two per cent carbolic, protective, absorbent cotton, and carbolized gauze. Children were bathed with bandages on, and these were renewed when dry. The results were not as good as desired and many deaths from sepsis continued to occur. It was next sought to have the dressings less occlusive. The stump was simply wrapped in iodoform or sublimate cotton. Dressings were sometimes changed daily and sometimes permanent. With this management cords still putrefied and sepsis was not prevented. (Also, iodoform poisoning occurred.) Cotton, by "felting" with the wound, constituted a disadvantage also. Antiseptic lotions were next tried. The stump was treated with lotions of phenol, thymol, boric and salicylic acids, etc. These wet dressings were soon abandoned. Putrefaction occurred more commonly than by any other method, and separation was much delayed. Glycerin dressings were an improvement owing to their dehydrating property. Wet dressings were relegated to the past along with occlusive dressings, and antiseptic dusting powders were used. These were often irritating and promoted suppuration, fungus, and delayed separation. Epstein has learned that asepsis is preferable to antisepsis, simply keeping all bacterial life away from the stump. He says that traction in the stump may prevent a well-formed navel.

Cholmogoroff (1889) says that the plaster-of-Paris bandage brings about mummification more completely than does any other method.

Winckel (1893) simply envelops the stump in ordinary surgeon's cotton, which excludes putrefactive germs and prevents motion.

Lambinoir (1894) discusses numerous dressings with view to safety and early fall of the navel. He has tried Loov's method of using glycerin, but does not like it. He decides that plaster (of Paris?) is the most serviceable dressing, used according to Sutugin's method.

Seitz (1894). After the first bath the stump is dressed with four per cent salicylic cotton. The dressing is changed twice daily.

Keilmann (1895) has learned very much from the habit of daily inspection of cords. Yellow secretion and granulation do not necessarily indicate pus. By the following method Keilmann had 400 cases without a single instance of fever (*sic*). He formed a stump of not over 2 to 3 centimetres long and dressed it with dry surgeon's cotton. No daily bath. Nurses forbidden to use traction to remove the cord. The time of falling of the cord is no criterion of best results.

Dührssen (1897) wraps the remains of the cord in sterilized salicylic wool. Bastard (1897) argues for a dressing that will favor drying of the cord and shield it from bacteria. He advocates antiseptic cotton as a dressing. Paquez (1897) gives credit to Pinard for introducing the dry dressing in 1886. At present sterilized cotton is used in the Paris maternities, changed whenever soiled. Biniodide cotton seems to be the favorite. Neumann (1898) uses pledgets of cotton, changed in first three days and every second day thereafter. Grandin and Jarman (1898) object to any. No full bath. A pledget of sterile absorbent cotton or gauze is applied, wound about the cord, and left until the cord drops,—after separation, bismuth powder. Olshausen (2) and Veit (1899) are sure that the only treatment is prevention. This is best effected by dry sterilized dressings.

Kusmin (1899) advocates a plaster-of-Paris bandage wound around the cord after the application of a thick rubber ring, applied close to the skin edge, has cut off its circulation; he has used it forty-two times. The stump falls off from the second to the fifth day, ordinarily on the fourth. One dressing suffices, with care that it be not wet during bathing.

Jewett (1899) teaches that, after thorough drying, the stump is to be wrapped in absorbent cotton. Powder is to be omitted, as it prevents rapid desiccation. After separation the surface is to be kept dry.

Lusk (1885) says the wounded surface after separation should be dressed with carbolized ointment; Seitz (1894), that after falling of the cord, the navel should be rinsed twice daily with warm boric acid water and dressed with lint smeared with three per cent boric vaselin.

Taylor and Wells (1898) find that after the cord falls the folds of the scar should be mopped out with a saturated solution of boric acid, or, better still, a few drops of hydrogen peroxide applied with a medicine dropper.

Olshausen and Veit (1899). In navel suppuration and supposed arteritis, powder with salicylic acid, dilute with starch or dermatol. Tetanus antitoxin is suggested, but no record of its use is given.

Bathing or No Bathing.—Schwab gives credit to Keilmann, of Breslau, for the custom of omitting baths. Doktor (1894) advocates omission of baths. The children bathed daily lost more weight than those not bathed. Lambert (1897) uses no baths. Since 1891 Pinard has forbidden the daily bathing of the new-born. To test the advantages of this method, Bastard (1897) studied two series, each of 110 cases. The deliveries were non-operative, the children above the average weight. One set of children were bathed daily; the other received a single bath at birth. The navel string fell off in the unwashed children on an average of 5.4 days, whereas in those that were bathed the average was 7.4 days. Pathological disturbances, such as erythema about the stump, suppuration, etc., occurred in the bathed children in 19 per cent, in those not bathed in 6.3 per cent. It is therefore recommended that the new-born be not bathed until after the healing of the navel.

Bar (1897) says that it takes from fourteen to fifteen days for the remnants of the cord to separate, and does not bathe the child until such separation has taken place. Neumann (1898) advocates more aseptic and less antiseptic treatment. The indications are to keep away bacteria and to render the soil unfavorable. To fill both indications, do away with the bath until the cord falls, or, better still, until the wound heals. The bath water is infected from various sources, including the child's own skin during the bath. (Compare the agency of the bath in causing late gonorrheal ophthalmia.)

Anthes, in Fehling's clinic (1896), found that the bathed children presented a more favorable healing of the navel than those not bathed, and an earlier separation of the stump of the cord, while a lesser per cent showed temperature rises. Czerwenka (1898) has made researches which lead him to believe that bathing does not interfere with the course of the navel wound, which is non-reactionary; nor is the mummification process in the navel cord delayed; and, finally, that new-born children that are bathed thrive better than those that are not bathed.

On the ground of 150 observations Schröder (1898) concludes that the daily bath does not have an unfavorable effect on the

healing process. The first dressing consisted in all cases of sterile cotton and the binder; the others of salicylic acid and starch, 1 : 4; 15 per cent had temperature rises. Of these 22 children, 8 were bathed and 14 not bathed. Malodorous cords occurred once in the bathed children, 8 times in the others. The initial bath is probably harmless because the infant's skin is still sterile.

BRIEF SYNOPSIS OF TREATMENT.

According to Ploss many primitive peoples practised our common methods of treating the cord, since they made use of the cautery, or a short stump, or powdered charcoal dressings. This management appears to have been superior to the greased, perforated pad of the civilized nations. Stripping out the gelatin, especially in thick cords, appears to have been an ancient procedure, but it was not based upon any idea of asepsis and simply looked to prevent the slipping of the ligature.

When listerism became popular the umbilical wound was probably the last to receive the benefit of the teaching. Two extremes of treatment were inaugurated—one, the permanent occlusive dressing first advocated by Dohrn and Sänger about 1880, and which is used up to the present time in the form of the plaster-of-Paris bandage; while the other is the open-air method which goes by Goodell's name, and which is still used in a modified way by having the dressings as light and porous as possible. The first plan aimed to exclude the putrefactive germs and prevent moist gangrene and its results, while the second was based upon the fact that to insure speedy mummification of the cord exposure to the air was necessary.

These plans were rather overshadowed by the craze after antiseptic washes and powders (the latter especially advocated for their supposed desiccating effects). However, by 1888 Epstein stated that antiseptics had failed to reduce the mortality of navel infection and that all antiseptic powders are irritating and ineffective. Lewis Smith found boric acid entirely too weak to be of any use. Olshausen and Veit believe in using antiseptics for cause only—i.e., if there is reason to expect infection. Some recent writers still teach routine antisepsis (Fothergill, Dakin). Schliep believes that a weak silver nitrate solution (two per cent) is not only an antiseptic but an excellent desiccant.

Following antisepsis came asepsis, the chief objection to antisepsis being that it cannot operate actively against infection. Ahlfeld states that strict asepsis is impossible; suppu-

ration cannot be prevented. Simple asepsis, or the use of sterilized dressings, appears to have originated independently in America in 1883 (Babcock), and has been, and is now, used by more authorities than any other plan. The sterilized dressings are supposed to keep out putrefactive germs, act as a desiccant, protect the cord mechanically, and, of course, fill the main indication of preventing contact-infection. At the Paris maternities the biniodide gauze dressings are used in preference to others. Personally, both from experience and as a result of this study, plain sterile gauze dressings, changed only for cause, are preferred.

In addition to occlusion, the open-air method, antisepsis, and asepsis, numerous special plans have been advocated. Von Budberg recommends alcohol as a desiccant and antiseptic; Allen and others recommend glycerin; Horn uses clay, etc. All of these reporters present series of favorable results from the methods of their choice.

LIGATION.

No Ligature.—It is astonishing to find in the voluminous compilation of Ploss (2) what a large number of ancient or savage peoples omitted ligature of the cord. This is only partly explained by the arrest of hemorrhage due to contusion of vessel ends; for while it is true that many tribes severed the funis with the teeth, or by hammering between stones, or by cutting with blunt muscle shells or bamboo knives, yet many practised clean cutting of cords not afterward ligated. Lott has gone back to the earliest practices when he uses serrated crushing scissors in combination with stripping.

I have listed in the bibliography the names of some recent authors who have tried to revive the "let-alone" method. Kellar's paper is of importance, because he has 2,000 cases of non-ligation to report with good results. He specifically states that there is no danger of hemorrhage without ligation. The ancient practices and such testimony must indicate that too much apprehension of bleeding has probably been entertained.

The frequency of umbilical hemorrhage may be less than we fear. Fürth met with only thirteen instances in 50,000 new-born children. But Credé and Weber say that at the Leipzig clinic before using the elastic ligature not a week passed without hemorrhage, more or less. Brothers (1) thinks he has seen a dozen cases in less than 5,000 new-born children. He says:

"In the majority of cases, after ten to fifteen minutes, the blood pressure in the cord sinks, and, even without a ligature, no serious hemorrhage can take place." To this we would add, no serious hemorrhage after the first hour or so. In premature children with imperfect respiration, or in full-term asphyxiated children with extensive pulmonary atelectasis, the tension of the umbilical circulation may be sufficient to give rise to dangerous hemorrhage from neglect in properly securing the cord (Runge).

Special Knots.—Multiple turns or ties are often recommended. Sänger (1880) would treat the stump of the cord like the pedicle of an ovarian tumor—transfix it with a needle, avoiding the vessels, and ligate on both sides.

Budin (1) (1896) recommends that the ligation of the navel stump shall be undertaken in such a way that, 2 or 3 centimetres distant from the navel, a thread shall be tied in the usual manner. Then the cord is cut 1 centimetre from the ligature, and after this the ends of the thread are tied perpendicular to the first ligation over the surface of the cut. Finally, with the ends of the same thread, each of the halves of the navel stump is separately ligated. In the many years that this "champagne-cork ligation" has been used in the Charité and the Maternité no case of secondary hemorrhage has occurred.

Elastic Ligatures.—Dickson (1874) employed as a ligature a silk elastic ribbon 4 millimetres wide, and Matthews Duncan indorsed it. Bayles (1876) recommended india-rubber rings doubled and sprung over the cord. Budin's studies (2) (1880) on the elastic ligature of thick cords demonstrated its value. A pure rubber cord, 2 millimetres in diameter, is wound about the funis four or five times. To steady the slippery navel string a match must be laid alongside it, and over this and the cord the rubber is wound: the match is then broken to remove it. Whereas numerous strong turns of other ligature materials only reduced the cord to 6 millimetres in diameter, the elastic brought it down to a thread of 2 millimetres. The former admitted a probe beneath, but the latter would not.

Budin concludes from his experiments that ligature with materials other than rubber may be "absolutely ineffectual" in fat cords, as water can be forced through under very moderate pressure; Credé and Weber confirmed these findings. After some hours very slight pressure will suffice to force a current past an ordinary quadruple ligation. Stripping the cord made

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little difference in their results. The authors loop the doubled elastic around the cord, carry the ends in different directions, and tie. Audebert (1897) advocates the elastic ligature in case of a "fat" cord. My objection to elastic ligature lies in the need of carrying fresh rubber, and in the rotting and brittleness of the material if other than fresh. Tuley recommends rubber —especially for the ligation of thick navel cords—with the instrument recommended by Kellogg, which holds the ring firmly while it is applied. Kusmin (1899) uses the rubber ring ligature under plaster-of-Paris.

Nijhoff (1897) gives an elaborate historical review of the question whether one should employ a *single or double ligature* of the cord. In Germany the double ligature is the fashion. Tarnier and his school tie but once, because Budin and Ribemont have been led to believe, according to their researches, that the placenta is the more readily separated. Hart and Hirst and Jewett believe in a single ligature.

Forceps.—Duke (1894) describes a clamp for the cord which works with a spring. The stump is threaded through a hole in the flat part of the clamp. The superposed spring holds it tight and the part beyond is amputated. The clamp drops off with the cord. The amount of tissue retained by the spring is very small. Duke says that practically no dead or dying tissue is left in contact with the navel. (A wood-cut not very satisfactorily illustrates the clamp.)

In place of a ligature Bar employs a small clamp (see Peau de Cerf, 1897). After sterilization it is placed on the cord in the direction of the long axis of the body close to the skin edge. The cord is then cut off close to the jaws of the clamp and a dressing applied to prevent any pressure upon the abdomen. From twenty-four to thirty-six hours later the instrument is removed and that portion of the navel string which has been compressed, being parchment-like in appearance, is cut off close to the skin. An antiseptic dressing is applied. The small fragment of the cord drops off on the fourth or fifth day. The child is not bathed until the slough separates, as Bar believes this is in the interest of asepsis and because the cord dries out most quickly this way. In the 100 cases in which Peau de Cerf carried out this procedure no single case of infection occurred. In 85 cases healing occurred promptly, and in the remainder a small moist spot alone remained.

AMPUTATION.

The various methods of cutting the cord may be grouped first, according to the location of the cut:

(*a*) Amputation with a long stump.

(*b*) Amputation with a short stump.

(*c*) Amputation with no stump.

And, secondly, according to the time at which the ligature is placed, thus:

1. Immediate or primary.

2. Late primary, one to two hours after delivery.

3. Secondary, a few days after birth.

Taking *secondary amputation* first. Runge ordered it performed close to the navel whenever there was reason to suspect that infection had occurred or was likely to occur. Miller (1888) amputates the putrid part of the stump. Ahlfeld, in the 1894 edition of his text book, says: "Recently we have removed the stump on the third day, cutting it close to the skin of the navel. We disinfect the stump before amputation and strew powdered boracic acid on the cut surface. On the day following the little stump is almost covered by the abdominal integument." But he has cut out this statement from the second edition (1898). He states his present practice to be temporary ligature at birth, and placing of the permanent ligature one or two hours later when the cord has somewhat dried, cutting close to it—that is, *late primary amputation.*

When a cord persists for any reason and does not separate, most authorities agree in advising secondary complete amputation.

Immediate or primary amputation with the long stump is the general practice. Immediate amputation with no part of the cord left to slough is here advocated.

(*a*) *Long Stump.*—Many savage people leave the stump as long or half as long as the child (Ploss). Almost all the text books and writers state specifically that a long stump is desirable. The average is 5 centimetres, or 2 inches. This may be taken as the standard teaching. The reason for all lengths from 2 centimetres upward seems to be that thereby room is left for a second ligature on the cord nearer to the abdomen in case of hemorrhage. Bobbin one-sixteenth of an inch in width, that it may not cut into the vessels, is the usual ligature.

(*b*) *Short Stump.*—To decide that 2 centimetres shall be the dividing line between a classification into short and long is en-

tirely arbitrary, but is based on the fact that, with the ordinary ligature material, tying at or near the skin edge necessitates a length of from 1 to 2 centimetres.

Ploss tells us that the Northern Australians cut the cord very close, as well as some of the Pacific Islanders, the Hottentots, the ancient Romans, and the Japanese. Dohrn (1880) put the new-born on a table, washed the stump in two and one-half per cent carbolic lotion, and tied again, short. Runge (1881) taught that the cord, if large, should be tied short and cut off close to the ligature. Eröss (1891) has seen better results in a study of 1,000 cases with a stump of 2 to 3 centimetres than with one of 5 to 6 centimetres. Risch and his brother (1889) have for years tied the cord as near as possible to the groove of demarkation, then rubbed out the jelly of Wharton. Doktor's (1894) best results in three large series were with cords cut as close as possible—1 centimetre. Since cutting close he has had but two hemorrhages (in over 200 cases).

Ahlfeld (2) (1898), as the result of numerous experiments, believes in the principle of shortening the stump soon after birth to the smallest allowable mass. After one to two hours the partly collapsed cord is tied 1 centimetre above the skin and cut one-half centimetre further out. '' If the ligature is placed close to the skin margin there may form a hematoma in the cord which might lead to undesirable consequences (Wolterdorff)." Neumann (1898) finds that the cord is best tied as close as possible with tape 4 millimetres wide, the stump being but 1 centimetre in length, '' which means a minimum of dead tissue." Pierson (1898) advocates an abbreviated stump.

Dr. Charles Jewett, in a personal communication, says that a very short stump is slower to slough than the long stump, and my own observations during some years have been to the same effect. Three-fourths of an inch is his present location for the ligature, the end projecting one-fourth of an inch beyond.

NO STUMP.

(c) *No Stump.*—Removal of the cord at the skin edge or capillary margin by ordinary surgical methods does away with the old putrefactive problems. The vessels may be ligated or not, sutures may be placed or omitted. Flagg practised this method in 1893. I did it a number of times in 1899 before

knowing of Flagg's work, and have summarized the recent literature with the kind help of Dr. Edward Preble.

Immediate Complete Amputation.—We have already referred to secondary complete removal. *By Heat.*—Risch (1889) says: "The most expeditious method of healing the stump would be to sever with a knife where I tie [at the skin edge] and then sear with actual cautery. But I think the world is not yet ripe for this innovation." I urge against this method that the cautery involves a slough, and that it has been recently proven that a cauterized surface is readily infected.

In the endeavor to remove the cord entire and do away with a slough, I tried electro-hemostasis with Dr. Skene's forceps (1899). This is not a charring nor a roasting process, but a drying process. The vessel or the stump grasped in the bite of his instrument becomes, within the space of half a minute to two minutes, a white, horny ridge, almost comparable to the edge of one's finger nail in consistence and color. This edge does not slough, but promptly becomes reorganized when within the body—*e.g.*, on the pedicle of an ovarian tumor. Without the body the ridge is commonly cast off. As Dr. Pryor has shown, water pressure applied to the vessel from behind will make it burst elsewhere, but not at the end thus treated. The jaws of the clamp are vaselined, and the clamp applied so that the edge next to the abdominal wall is placed at the junction of skin and cord. While the cord is drawn upward, the clamp is closed firmly to its last notch, lifted away from the abdominal wall, the rubber shield placed beneath, and the current turned on for about two minutes. A little bubbling occurs as the juices sizzle out. The amount of heat is said to be about 180° F. After the clamp is removed, the scissors cut through the desiccated, flattened part of the cord rather close to the abdominal side, so as to leave but a narrow ridge projecting. Unhappily in some cases a tiny slough separates. The same result was obtained, but less readily, with a pile clamp and the Paquelin cautery, taking care that the stump was not charred, but turned white.

After making a number of trials with complete primary amputation with the scissors and publishing the suggestion, I found that Dr. Flagg had antedated this work. Perhaps many others have. In a letter to the editor of the *Medical News*, commenting on Dr. Lambert's article, Dr. Chas. E. B. Flagg,

Assistant Surgeon U. S. A., writing from Fort Duchesne, Utah, in 1897, says:

" Applying the rules of general surgery, since 1893 I have eliminated after-treatment of the umbilical cord from my obstetrical practice by amputating the cord at the umbilicus. After applying two artery forceps and severing the cord between them, the child is handed to the nurse. After completion of the third stage of labor, and after the necessary attention has been given to the mother, including suture of the perineum if it has been lacerated, I return to the cord. My hands previously having been prepared, the field of operation is rendered sterile, the hemostatic forceps are moved up to the junction of the cord and the skin, the cord is severed close to the forceps, and the vessels picked up and separately ligated with small-sized catgut. Subgallate of bismuth and aseptic gauze are then applied and held in place by a cheese cloth bandage. The wound heals under a scab and is safe from infection. "

" In my next case I shall take a step forward by suturing the wound and sealing it with collodion. I will not claim originality for this method, for, though it is original so far as I know, I have not made an exhaustive study of the literature on the subject. I wish to suggest the general adoption of this as the best method of treating the cord, and would like to learn of any objection to its employment."

The description is not quite clear. The hemostatic forceps are said to be finally placed at "the junction of the cord and skin, the cord severed close to the forceps, and the vessels picked up and ligated." Crushing of the edge is likely to prevent primary union, and is unnecessary. To place a forceps thus is to conceal the structures which one should remove, namely, the cord sheath entire, down to or including the skin edge.

Dr. Flagg writes me (May, 1899) that he has seen only good results from ligation and suturing.

In January, 1899, I wrote the following—it was published March 4, 1899:

" There is a weak spot in obstetric antisepsis. It is not a little curious that we should deliberately elect sloughing and suppuration as the method of healing of an obstetric wound. It has occurred to the writer more than once that a late puerperal infection, or a septic process in the breast consequent on a

fissured nipple, or the lack of union in a primary perineal re-
pair, might have its cause in the decomposing umbilical stump.
Putrilage is occasionally found. Warmth, moisture, and
pocketing favor sepsis. Few nurses have been trained to care-
fully make traction on the stump in the daily dressing, and, at
the same time, draw back the skin folds so that every crease
and cranny is exposed. Even with a dry pack of every crease
with aristol or iodoform or other powder, we cannot be sure
that the wound is not contagious ; under such a crust I have
found pus. The nurse takes no special precautions to sterilize
her hands every time she comes in contact with the abdominal
region of the baby. In the smaller maternities, where the
same nurse dresses cords and cares for the patient in labor, the
risk is evident.

" Other Methods of Ligation : We may treat this stump as
we do in other amputations, by making sure that there is no
material left to undergo necrotic change. It ought not to be
difficult to isolate the vessels at the junction of the skin and
the amnion when the jelly of Wharton has been stripped out,
and ligate each vessel separately with catgut or very fine silk.
Then the vessels could be cut off close to the ligature, the
stump of the cord carefully dissected away along the skin edge,
the skin closed over with a subcuticular silk suture, a drying
powder dusted on, and a small pad of gauze applied. The
adhesive strap and the binder would complete the dressing.
Oozing from the capillaries that run a few millimetres into
the cord should be easily checked by the suture and pressure.

" Such a method would be feasible only in maternities, or in
the hands of men used to clean surgery. The open method
now in vogue insures good drainage."

My experiments have covered these methods in amputating
at the skin margin:

    A. Ligature of *vessels*—not of whole cord.
    B. Suture of fine silk, usually without ligature.
    C. Pressure alone.

Also modifications and combinations of the above:

    A. *Ligature of bared vessels.*
        1. Of isolated vessels, all in one ligature.
        2. Of vessels individually (Flagg's method).
        3. Of vein alone.
        4. With fine catgut.
        5. With very fine silk, which cuts itself out.
        6. With ligature and suture as a single thread.

B. *Suture.*

    1. Subcuticular.

    2. Purse-string; at skin margin, or else rolling cuff inward.

    3. Continuous; through skin edges only, or beneath vessel ends.

    4. Figure-of-eight beneath vessels.

    5. Lembert, rolling skin cuff inward.

    6. Silk: fine, to cut itself out; deep, removed on third day

    7. Silver wire, to be twisted tighter by nurse, if required.

    8. Encircling bared vessels with same thread that closes skin edges.

    9. Placing sutures before any cutting is done.

    10. With pressure dressing.

    11. Without pressure from dressing.

C. *Pressure from dressings.*

    1. Pad or roll of gauze held by binder to prevent bleeding.

    2. Pad or roll of gauze held by adhesive strap.

    3. Navel carefully inverted by tiny roll.

    4. Flat pad, no inversion.

And they are successful. I have had no rise of temperature, no bleeding, no fetor, no discharge except serum.

Elaborate detail concerning the various methods classified above is hardly necessary. A typical example of each class may be given.

Preliminaries to all Three Methods.—As the child's trunk makes its exit a sterile or clean towel is so applied to the abdomen that the cord and the umbilical region make no contacts once outside the grasp of the vulvar ring. The trunk is wrapped in the towel as the baby is laid down or resuscitated. As soon as pulsation grows feeble the cord is clamped beyond the towel between two Keith forceps and cut. Artery clamps have insufficient bite for large cords. The child is laid aside until the placental stage is completed and the perineum has received attention.

The material is prepared. The choice of method is made, and now the child is laid on a table. A towel is wound about its arms and another about its legs to keep it quiet and to insure a clean field. The towel is unwrapped from about the abdomen. The nurse draws the cord out by the forceps that had been placed six or eight inches away from the navel. Her hands need not be safe, but the operator's are prepared as for any operation.

A. *Simple Ligature.*—With blunt-pointed scissors snip all around the skin margin, avoiding the place where the vein

shows near the surface. At this place it is not always easy to cut the sheath without opening the vein. The sheath and gelatin are stripped backward with as much jelly as possible. The vessels thus span the gap, standing alone. A fine silk or catgut ligature around all three, or about the vein alone, is placed. The ends of the vessels are cut short, and the cord is off. The stump tends to roll inward. No antiseptic solution should have been used, unless one has ground for fearing gonococcus infection. No powder is to be used. A dry gauze pad under the binder suffices. Scissors, ligature material, and one or two forceps are needed, besides the gauze for sponge or

FIG. 1. FIG. 2. FIG. 3. FIG. 4.
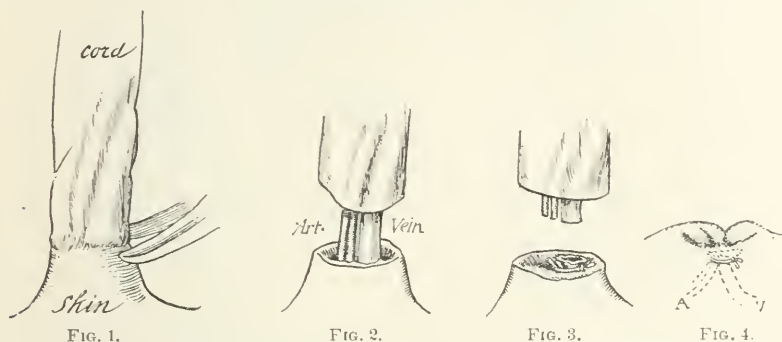
FIG. 1.—The scissors free the cord from the skin, and then push up the sheath and the jelly.

FIG. 2.—The trousers-leg slipped upward with the gelatin, exposing the vessels. The ligature is placed as low as possible.

FIG. 3.—After ligature and cutting away. FIG. 4.—The stump rolls in at once.

dressing. Fine silk cuts itself out, the end of the tied vessel seeming to reorganize.

This method is much more sure to control bleeding than mass ligature of a cord.

B. *Suture.*—The cord is drawn upward by the nurse as before. The cuff of the skin is caught between the palmar surfaces of the left thumb and index finger, and one closure of the scissors blades severs the cord through the capillary ring. A reflux of blood comes from the cord. Without letting go with the left hand, an artery clamp pulls the vessels up; the needle is taken up in the right hand and a simple continuous stitch is run across and its ends tied together, or a subcuticular (Kendal-Frank) put in place. If it is desired to ligate as well as to sew with the same silk, one loop of the stitch sweeps around the arteries and the other about the vein. Superficial

bites may be taken in order that the little stitch of fine silk will cut itself out.

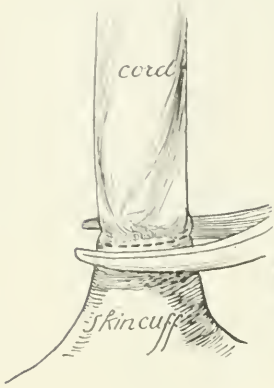Capillary oozing or a few drops from the vein are arrested
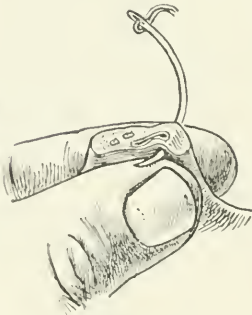

FIG. 5.   FIG. 6.   FIG. 8.

FIG. 5.—Removal of cord at one snip of the scissors, the fingers holding the stump, as shown in the next cut.

FIG. 6.—The fingers still hold the stump while suturing.

FIG. 7.—One form of suture.

FIG. 8.—A suture ligature.

FIG. 9.   FIG. 10.   FIG. 11.   FIG. 12.

FIG. 9.—Ligature and suture.

FIG. 10.—Subcuticular suture.

FIG. 11.—Subcuticular drawn taut.

FIG. 12.—Inversion of suture within a few hours.
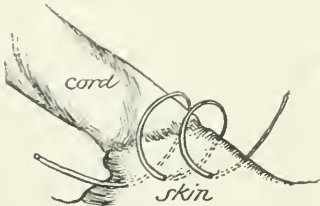
FIG. 13.—Suture placed before amputation.   FIG. 14.—Sutures drawn to one side and cord ready to be cut.
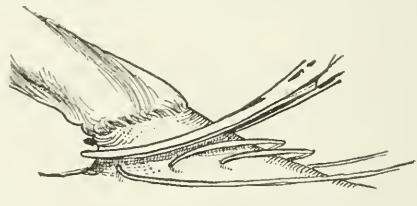
by a little pressure from a plain sterile gauze dressing under a binder.

Scissors, a sharp-cutting needle to penetrate rather tough skin, fine black silk, gauze, and artery forceps are needed.

The timid may place the stitch or stitches before cutting at all, as Dr. George R. Fowler suggested to the writer.

C. *Pressure Alone.*—In removing the cord at the skin edge, in those cases where I dared to trust to pressure by itself, I have left the vessels as long as in the cases where they were ligated, in order to be able to go after them later if necessary. It has not been necessary. They retract at once. The oozing is momentary. At first I use a goodly but graduated pressure under the binder or an adhesive strap, either with a large or small pad. But very moderate pressure seems to suffice. The pressure method will require further testing in a long series of cases, to see if it gives any more secondary hemorrhages than older methods. This must occur in maternities where the skilled assistance at hand renders testing safe. Torsion, or momentary clamping, or even the recently revived crushing of the vessel, might act well if no slough resulted. The infrequency of hemorrhage and the immunity of those who do not ligate is stated on page 48. No ligature really holds the vessels after a couple of hours, except they be bared to place it.

Ribemont (2) says that when the cord has been accidentally torn off at the level of the navel, pressure of a dressing and watchfulness suffice. Dupuy's case bled vigorously, however, and ligature was required to check it. The rubber adhesive plaster irritates the skin of most infants. The old yellow adhesive is much less objectionable.

Objections to Complete Primary Amputation.—1. Increased danger of contact-infection owing to operation on parts supplied with lymphatics, as compared with the ordinary ligation of vessels and jelly on parts having no nutrient capillaries or absorbents.

2. Lack of drainage in case of infection.

3. Danger of concealed secondary hemorrhage (hematoma) after the suturing method.

4. Inaccessibility of vessel-ends in case of bleeding, as compared with facile placing of second ligature where stump long.

5. The risk of striking an umbilical hernia.

6. As this is surgery, it is not yet adapted to the general practitioner, and to the midwife only the pressure method can be trusted, if that method proves safe.

To admit most of these objections is to confess that we, as instructors and surgeons, fail in our attempts to drill the stu-

dent in hand-cleaning and instrument-boiling and avoidance
of unclean contacts, and that as to this generation of general
practitioners, we give them up. Our method requires hands no
cleaner than for a vaginal examination, and far less wound
knowledge than for the repair of that perineal injury which
zigzags through fascial and muscular planes, their anatomy
disguised by stretching and edema.

Even in the matter of secondary hemorrhage not controllable
by pressure, any one can roll open a superficial wound, draw
up its centre with an artery forceps, and seize and ligate an
oozing vessel-end. A hernia at birth calls for closure of the
canal by sutures in any case. Hernia is exceedingly rare
at this time (Tarnier (2), Budin), though common enough a
month or two later.

After-care.—A small square of plain gauze lies on the
wound and may become adherent to it. Over this a larger
dressing is placed, and a moderately snug binder is pinned or
sewed on. As with any other clean wound, the dressing must
not be changed except for cause. The baby is not tubbed for a
week until union is secure.

The first washing immediately after the operation has been
just sufficient to get rid of any vernix caseosa that is present,
and during the week no general washing is needed.

Flagg speaks of his cases healing under a scab. This is pro-
duced by the dermatol. It is better to permit drainage. Sani-
ous oozing, as from any fresh wound, usually occurs. In
some instances, on rolling the wound outward on the third or
fifth day, the inverted skin cuff is found to be moist. It may
be that there is watery discharge from the gelatin within the
ring of skin. Some of the inversion of the stump may be pre-
vented and a handsomer flush result secured by taking off part
or all of the skin cuff. Dry primary union is thus more cer-
tain. Most adult navels are dirt accumulators—accumulators
not easy to clean. Deep inversion with the line of union solidly
fixed 1 to 1.5 centimetres below the level of the skin of the
abdomen may be found by the ninth day if the whole skin pro-
jection is used as flap.

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SOME OBSERVATIONS ON THE EARLY USE OF PURGATIVES AFTER ABDOMINAL SECTION.

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EVERY surgeon who has the direct charge of patients after they have undergone abdominal operations must be impressed by the discomfort which most of them experience as a result of the accumulation of flatus in the intestinal canal. Unfortunately, too, discomfort is not always the only result, for occasionally a patient will die some days after a comparatively simple operation, the only symptoms having been marked abdominal distension and obstinate constipation, with no rise in the temperature or quickening of the pulse until a few hours before death, and at the postmortem examination of such a patient the most striking lesion is the marked general distension of the intestinal canal without any signs of obstruction and with only a beginning peritonitis.

As but little attention has been paid to the causation and treatment of this distension, and, indeed, to the general subject of the care of the bowels after operation, the observations which we have made on the administration of purgatives may be helpful to other surgeons interested in the subject.

In the following pages are the records of some experiments made in the gynecological wards of the Johns Hopkins Hospital on the early use of purgatives after abdominal operation, and from them we hope to prove that this method is indicated in practically all cases; also, that a complete emptying of the bowel before operation is both of assistance to the surgeon by allowing a better exposure of the diseased area from the flaccid, empty condition of the intestine, and to the patient by lessening the tendency to distension and other troublesome post-operative sequelæ.

The routine preparatory treatment before any changes were instituted has been to give the patient half an ounce of Epsom salts the evening before the operation, followed early in the morning by several enemata.

The routine after-treatment was to give no purgative and to make no attempt in any way to move the bowels until the evening of the day following the operation, when the patient was given two grains of calomel. either in one dose, or in divided doses at half-hourly intervals.   This was followed in the morning by a warm soapsuds enema containing half an ounce of glycerin, and enemata were then given at intervals until the bowels were moved.   These patients, almost without exception, were much distended on the second evening, the epigastric region being tense and hard ; they also had usually a good deal of general abdominal pain, and were eructating gas and probably somewhat nauseated.   Usually three enemata at least were needed to be effectual, and it was commonly the fifth or sixth day before they were comfortable, the distension gone, and flatus passing freely.

In order to have data with which to compare the later results, careful notes were made in ten consecutive cases following this old method, though these were only necessary that we might have accurate notes made under the same system as those that followed for comparison, as otherwise any number could have been used from the previous records.   Of these ten, four were operated upon for pelvic inflammatory disease, one had a panhysterectomy for tuberculosis of the endometrium, one a panhysterectomy for carcinoma, two had a suspension of the uterus, one the removal of multiple myomata from the uterus, and one a cholecystostomy for gall stones.

I wish to state here that in all the cases the day of operation has been considered the first day, the second day being the one after operation, and so on.

The ten used as control cases were all given two grains of calomel at 8 P.M. on the second day, and all had a warm soapsuds and glycerin enema at 8 A.M. on the third day, followed later by other enemata until the bowels were moved and flatus passed freely.   Among these ten patients two enemata were sufficient in one case, three were necessary in six cases, four in one case, and five in two cases; and eight out of the ten were noted as comfortable on the fifth day, the distension and the accompanying nausea and vomiting having disappeared.   One case was not comfortable and free from distension until the sixth day, and one not until the seventh.

The first innovation was in the preparation of the intestinal tract previous to operation.   We had been annoyed in quite a number of the patients both by troublesome distension of the

intestine during the operation, making it difficult to expose the field, and by the passage of fecal matter while the patient was on the table.   In fact, these annoyances first called attention to the condition of the intestinal tract, and made it evident that the previous efforts had not obtained the wished-for result in emptying the coils of the contained fecal matter and intestinal gases.

It is always unfortunate that patients cannot be under observation for some time before the operation, that the intestinal condition might be thoroughly attended to,   As this, however, was not always possible in a large hospital, the difficulty was met by the administration of a purgative on the day of entrance, unless contraindicated by some special condition. Then on the day before operation the patient was ordered in the morning half an ounce of Epsom salts, to be followed in an hour by a second half-ounce.   Six hours later a soapsuds enema of about a pint and a half, containing one ounce of glycerin, was given, and at 11 or 12 o'clock the same night another soapsuds enema was given.   The patient was also allowed only liquid diet, consisting chiefly of albumen, for at least twenty-four hours before the operation, and nothing after 12 at midnight, save possibly half an ounce of sherry just before going to the operating room.   Following this routine we noticed immediately a better condition of the intestines, which were usually empty, flaccid, and easily held out of the way during the operation.

The after-treatment was changed by administering two grains of calomel at 6 o'clock in the morning following the operation, and at 4 in the afternoon a soapsuds enema containing one ounce of glycerin was slowly injected, using a rectal tube passed some distance into the bowel.   Usually a second enema of the same kind was ordered for the early morning if the patient was uncomfortable or distended, and later a third and fourth if necessary.

Thirty consecutive cases were treated in this way, the operations all being abdominal and for various gynecological ailments.

Of these 30 cases, one enema was sufficient with 2 cases, the enema in both of these being followed by a large soft stool and the free passage of gas; with 10 two enemata were sufficient to empty the bowel and cause passage of gas with the enema and following it; with 13 patients three enemata were used, in 2 the first and second being noted as ineffectual, while in 11 the

patient was still uncomfortable, though the first two were par-
tially effectual; with 4 patients four enemata were necessary to
completely empty the bowel and relieve the distension, and 1
patient required six enemata before complete relief.

Among these, 7 were completely comfortable and free of dis-
tension on the third day, 14 were comfortable on the fourth
day, 7 were comfortable on the fifth day, and 2 on the sixth
day. By comfortable is meant, with these cases as well as the
10 preceding ones, that the nausea had entirely ceased, the dis-
tension had disappeared, and the abdomen was soft and free
from tenderness.

Comparing these two groups of cases as to the number of
enemata needed to obtain relief, we find that while in the first
group one or two enemata were effectual in only 10 per cent, in
the second nearly 40 per cent of the cases were completely
relieved by the same number. Three enemata relieved com-
pletely 60 per cent of the first group and only 43.3 per cent of
the second; but this is explained by the higher figures of the
second group with one or two enemata, as while four or more
enemata were required in 30 per cent of the first group, only a
little under 20 per cent of the second group needed so many.

A comparison of the length of time before the patient became
comfortable is also of interest. Among the 30 cases 23.3 per
cent were noted as comfortable on the third day, 46.6 per cent
as comfortable on the fourth day, and only 29.9 per cent were
not comfortable until the fifth day; while, on the other hand,
in the group of 10 cases, 80 per cent were noted as comfortable
on the fifth day, and 20 per cent were not comfortable until
the sixth or seventh.

These figures are striking, and at least make further argu-
ment on the subject of increased danger to the patient following
early interference with the bowels unnecessary. The experi-
ments have further proved to us practically that, contrary to
the general opinion, early attempts to move the bowels do not
add at all to the discomfort suffered by patients immediately
following operation, but rather tend to lessen them; and we
have noticed time after time the immediate disappearance of
troublesome nausea or vomiting and abdominal pain, with a
slowing of the pulse and possible drop in an elevated tempera-
ture, when the bowels were well moved for the first time.

Caution is necessary in using the enemata when the rectum
has been wounded during the operation, especially if completely
torn through, and in such cases they are contraindicated for

the first few days, as either the tube or the fluid under tension could be easily forced through the wound. Dependence in these cases must be placed on the medicine given by mouth, or at most an enema of four to six ounces of olive oil may be slowly introduced into the rectum through a soft male catheter.

As it seemed necessary the routine as first elaborated was changed in minor details. One of the most important changes was the addition to the soapsuds and glycerin enema of two drachms of the spirits of turpentine, which was found to be a valuable addition, as it apparently increased greatly the passage of flatus, stimulating especially peristalsis in the large bowel.

It was also found of advantage to use on the evening of the second day some simple laxative to keep the intestinal peristalsis in motion.

Several other forms of enemata were also tried. In 10 cases we used six ounces of olive oil as the first enema at 4 in the afternoon, followed four hours later by a soapsuds and glycerin enema, but with no better result than followed the first method. Ten cases were also taken and one ounce of Epsom salts added to the soapsuds and glycerin enema, also with no better result.

During the course of our experiments an article by Dr. H. T. Byford, entitled "An Improvement in the Technique of the After-treatment of Peritoneal Section," appeared in THE AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN, July, 1898, in which he urged also the importance of early and free purgation, or rather stimulation of the intestinal peristalsis, following the abdominal section.

His method consists in careful dieting and preparation of the patient and the administration of a purgative immediately before operation. As soon as the patient recovers from the anesthetic after the operation, drachm doses of Epsom salts are given every hour, and a small glycerin and warm-water enema after the sixth dose of salts. The salts are continued after this every hour, with an enema every three hours, until the bowels move and flatus passes spontaneously.

As this was in the direct line of our experiments, we tried the method in 11 consecutive abdominal operations and were impressed with its value, especially in those cases in which there has been much handling of the intestine or where large areas of adhesion had been freed.

We modified Dr. Byford's method in not using the fluid extract of cascara sagrada before operation, but followed his

advice in the previous preparation of the patient and in the after-treatment.   It is not necessary to redescribe the preparation previous to operation, which was practically the same that we had already followed; the after-treatment consisted in administering to the patient as soon as she became conscious a drachm of Epsom salts and the same amount after this every hour.   When six doses had been taken an enema consisting of two ounces of glycerin and four ounces of warm water was slowly introduced into the lower bowel through a soft tube, and this was followed in three hours by another of the same kind, the salts and enema being continued at the same intervals until the patient passed flatus spontaneously between the enemata.

With these 11 patients the number of drachm doses of salts administered at hourly intervals varied from six to fourteen, and three enemata were usually necessary before the flatus passed freely.

Contrary to our expectations, no nausea followed the administration of the small doses of salts, which was astonishing, as our experience in the past had been that nausea almost invariably followed when, as used to be the practice, half an ounce of the same salt was given following the calomel.   In fact, these small doses, frequently repeated and given in rather dilute solution. apparently relieved the nausea and were taken eagerly by the patient, and in none of them was it necessary to repeat any but the first dose, and this only a few times.

The only criticisms which may be offered to this treatment in our small experience are the greater discomfort of the patient from frequent enemata, great thirst, which was complained of bitterly by most of the 11 cases, and a tendency to nausea and constipation on the fourth or fifth day.

The chief reason for attempting to move the bowels so early may be stated, in a few words, as being an effort to assist and increase the normal peristalsis if present, or to stimulate it into action if not present. thus preventing an accumulation of gas in the intestine with consequent dilatation of its walls, partial paralysis of its musculature. interference with the circulation, and, finally, an escape through the less vitalized intestinal wall of the contained pathogenic bacteria.

This partially paralyzed condition of the intestine with distension following an operation is quite commonly seen, though fortunately in most cases it only reaches a medium grade before the bowels are moved.

We have had the misfortune, however, of seeing two cases

in which the distension resulted fatally. One, a colored woman, had a supravaginal hysterectomy for an uncomplicated myoma, but because of her fat abdominal walls, deep pelvis, and rather distended intestines much handling of the intestines was necessary, and to get them out of the way they were finally lifted entirely out of the abdomen and kept covered during the operation by pads of gauze constantly moistened with warm normal salt solution. Following the operation we found it impossible to get the bowels moved with the usual treatment, the abdomen became steadily more distended, and the patient slowly sank, and died on the fifth day. There was no rise in the temperature and pulse until a few hours before death, and the only find at autopsy was a tremendous distension of the intestines, with no signs of occlusion and a slight beginning peritonitis. The second was of exactly the same kind and followed an abdominal panhysterectomy for carcinoma of the uterus.

The cause of this condition is evidently some direct insult to the intestine, such as handling, the release of large bands or areas of adhesion, or long exposure of the intestine to the air, or it is due to the sudden change in the intra-abdominal relations following the removal of a large tumor or a quantity of fluid from the cavity. As proof of this, every surgeon must have noticed that those patients on whom a serious operation has been done accompanied by much handling of the hollow viscera, those in whom large areas of adhesions have been broken up, or when the intestines have been exposed, always suffer most from abdominal distension, while the simpler cases— for example, a suspension of the uterus in which the intestines have not been interfered with in any way—have but little difficulty. The same tendency to distension may also be noticed in cases where large fluid or solid tumors are removed, and in these it evidently follows the change in intra-abdominal pressure.

The sequence of events in the fatal cases is probably that there is first some paresis of the intestine either following the trauma or due to the changed relations; this condition allows the intestinal gases to collect instead of pressing them toward the rectum, as would occur were the normal peristalsis present. Following the collection there is necessarily some distension and thinning of the intestinal wall, with interference to the circulation and loss of vitality and resistance of the tissues to bacterial attack, and, finally, penetration of the intestinal wall

and a generalized peritonitis, which is usually the last occurrence before death.

In the non-fatal cases the dilatation is overcome by a return of the normal peristalsis before it reaches a very marked grade, and the symptoms in such cases are probably due to an autointoxication from the absorption of ptomains from the intestinal tract.

If this is true, our duty is plainly to assist the normal peristalsis if present, and to stimulate it to action if not present, which is certainly best done by early administration of purgatives, the free use of stimulating enemata, and also by the use of strychnia in small, frequently repeated doses.

Another important reason for the early stimulation of the intestinal peristalsis is to prevent, as far as possible, the formation of dense adhesions where large areas of raw tissue are left, or the formation of adhesions between knuckles of intestines and future occlusion, and it is theoretically correct to believe that by early peristaltic movements of the intestine this will be at least partially prevented.

In comparing our method with the one advised by Dr. Byford certain facts stand out prominently, and individual cases form themselves naturally into groups in which the one or the other form of treatment best meets the indications. As mentioned before, Dr. Byford's method is harder on the patient because of the frequent medication and frequent enemata, and it is also followed by most troublesome thirst; for these reasons it does not seem to be indicated in the less severe cases, especially the simple suspensions of the uterus, myomectomies, or the removal of uncomplicated cysts, etc. On the other hand, with our method, though the patient is more comfortable, no attempt is made to move the bowels from twelve to twenty hours, and several hours more must be allowed after ingestion for the purgative to take effect. In cases, therefore, where there has been much trauma, frequent handling or long exposure of the intestine, this time is necessarily given for the accumulation to take place, or, if there are large raw areas, for adhesions to form, and in such cases, if our conclusions are correct, the Byford method is indicated as causing almost immediate peristaltic movements. Therefore, though one must be guided by the indications in each individual case, and though no fixed rules can be laid down, still we feel justified in drawing the following general conclusions:

1. That it is important both for the welfare of the patient

and for the comfort of the operator to attend carefully to the diet and to the thorough emptying of the bowel before any abdominal operation.

2. That the bowels should be moved and the distension re lieved soon after operation, both for the comfort of the patient as well as to avoid possible dangerous complications.

3. That in the simpler groups of operations, such as sus pensions of the uterus, myomectomies, the removal of uncom plicated ovarian tumors, and in uncomplicated hysterectomies, the administration of the calomel and use of enemata on the second day is followed by a perfectly satisfactory conva lescence.

4. That in cases of beginning peritonitis, in cases where numerous adhesions have been broken up or large raw areas left, in cases where the intestines have been freely handled or long exposed, and, finally, in emergency operations where no previous preparation can be made, Dr. Byford's method of immediate purgation is indicated.

In conclusion I wish to thank Dr. H. A. Kelly for kindly allowing me to follow out the observations in his department, and to thank Mrs. E. M. Simpson, the head nurse in the gyne cological ward, for her kind help in keeping for me the neces sary data.

THE RÔLE OF WOUND INFECTION AS A FACTOR IN THE CAUSATION OF INSANITY.[1]

BY

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THE introduction of the microscope in the minute analysis of pathological tissues and in the discovery and differentiation of atomic germs is rapidly revolutionizing the etiology of dis ease. The patho-bacteriologist, by his researches, has shown how prominent a factor the micro-organisms are in causing the many physical ills that affect and decimate the human race. Furthermore, we are beginning to estimate the potency of these organisms and their products in the frequent produc-

tion, directly or indirectly, of many cases of mental alienation.

The Germs of Wound Infection.—The bacteria usually found in wound infections are: (1) the streptococcus pyogenes, (2) the staphylococcus pyogenes, (3) the micrococcus of gonorrhea, (4) the streptococcus of Fehleisen, (5) the saprophytes.   There are other bacteria found in wounds, but the above-mentioned are the germs mostly concerned in wound infection.

Not only do the bacteria themselves act as a virus, but their chemical products—toxin and ptomain—possess a specific virulent action when absorbed into the body.

Wounds usually Infected. —1. Small abrasions, or incised wounds, or contusions on the face or on the scalp, usually subject to neglect.

2. Lesions of the genital tract entailed by maternity, such as perineal tears, bruising and contusions of the vagina, laceration of the cervix uteri, and the raw placental site in the puerperal uterus.

These wounds are the favorite portals through which the germs or their virulent products find entrance into the lymphatic or circulatory channels and thence distribute themselves throughout the system.

Effect of Infection upon the Constitution.—Action of infection upon the central nervous system is brought about directly through its circulation.   The contaminated blood filtering through the capillaries is absorbed into the cellular and ganglionic structures, bringing about abnormal changes in their protoplasmic elements, varying from cloudy swelling to distinct pigmentation.   These noxious elements disturb the harmony of their exquisitely balanced functions, interfering with the infinitesimal chemism so necessary to the production of rational action and thought.

The indirect action of the infection upon the central nervous system occurs through the disturbance of the organic mechanism engaged in the digestion of food.   The effect on the functions of the alimentary tract by the toxic material is to lower the nutritive qualities of the ingesta, and therefore the blood plasma, upon which the brain, like all organs, is dependent for the maintenance of its vitality.   Also, the infected blood current, circulating through the capillaries of the vasomotor centres, irritates these centres and disturbs through them the

equilibrium of the cerebral circulation, thereby enhancing the intoxication already produced in the centres of thought and reason. Furthermore, if in the infected patient there exists a prior condition of heredity, the effects of the toxemia are intensified. Is it, then, to be wondered at that such a delicately poised organ as the brain should show the various phases indicative of mental disquietude, ranging from hebetude or delirious muttering to the intenser or graver forms of melancholia and mania?

Effect of Infection Locally.—The effect of infection locally upon the wound or the tissues in its immediate vicinity is governed by the locality of the injury. Superficial wounds of the body, especially of the face and head, are easily amenable to treatment, and as a rule resolution of the wound is rapid and complete. Injuries, however, of the genital tract, from its situation, and especially if located in or on an organic structure, are more difficult of amelioration. Pathological processes in uteri often embrace the whole organ owing to its extreme vascularity, and by extension or penetration may easily implicate the adnexa or other pelvic contents. Thus to the burden of infection in puerperal cases are added inflammatory lesions which often of themselves wreck the future health of the individual.

The Insanities following Infection.—1. *Erysipelatous insanities.* A study of 8 cases of insanity traced to the infection of the streptococcus of Fehleisen shows that the insanity may occur during the attack of erysipelas or may follow the subsidence of the infection. They were all of the maniacal type, ranging from mild paroxysmal mania to acute, violent mania, which in some cases merged into a condition of chronic mania; 3, who became insane during the attack, recovered, 1 mentally improved, 1 died three months after the attack, and the remainder became chronically insane. None of the types of erysipelas in these cases were of phlegmonous nature, and the local inflammation made the usual resolution.

2. *The septic insanities of the puerperium.* The septic insanities of the puerperium embrace a larger field. For convenience they may be described under three heads:

(a) *Puerperal insanity, with little or no local lesion, caused by septic infection.* The insanities from this origin occur probably from absorption into the circulation of the toxins of an infected clot, either through the placental site or

some tear or abrasion, or by the absorption of the ptomains of the saprophyte germ, which find lodgment in the detritus of a puerperal uterus.

The majority of these cases, being of short duration, recover at their homes on elimination of the poison. They are usually of a mild confusional type or a form of muttering delirium.

(b) *Puerperal insanity complicated by gross local lesion, the result of septic infection.* The insanities of this class are usually of a more serious character than those of the former. The local inflammatory lesion acts as a focus, keeping up the prior intoxication by distributing a continued supply of the virus to the already poisoned circulation of the patient, or by reflex irritation. The majority of these patients do not recover their normal mental condition under ordinary systemic treatment.

The study of the histories of 98 cases admitted into the London Asylum since the year 1870, in which the alleged cause was given as the puerperium, discloses that just one-half, or 50 per cent, recovered reason. It is fair to suppose that very few of these had any serious local lesion complicating their insanity, as some recovered very soon after their admission. I have been able to examine gynecologically 23 of these 98 cases. In 22 of them were lesions ranging from subinvolution to complete agglutination of the pelvic organs. This would indicate that over 90 per cent of these cases had some complicating pelvic lesion. Suitable surgical measures being adopted in 21 of these resulted in the mental recovery of 8 cases and in the improvement of 4, while 9 remained unimproved. The 8 recoveries were included in the 50 per cent before-mentioned total recoveries in the puerperal cases.

I may say that 7 of the 9 who failed to show any mental improvement subsequent to surgical treatment had been insane for periods of from two to sixteen years.

(c) *Post-puerperal insanity induced by pelvic disease, the latter being the result of septic infection.* It is now generally recognized by obstetricians and gynecologists that a severe local sepsis may occur in the genital tract during the puerperium with apparently little systemic disturbance. This condition often escapes the notice of the accoucheur, as a result of which a prolonged and only partial convalescence ensues. The puerperal woman, on leaving her bed, has a constant feeling of malaise. The combination of pelvic disease, the main fact in causing the incomplete convalescence, to-

gether with the futile attempts to perform the duties of a wife and mother, ultimately result in a complete breakdown mentally and physically. This unfortunate sequel to the puerperium often occurs six, eight, or ten months, or even longer, after the birth of a child, and can be traced back to its puerperal source. Unfortunately, however, the physicians who fill and sign the commitment papers either are not in possession of the patient's previous history or they fill out the forms very carelessly, giving very few, if any, facts of the prior health of the patients to be admitted. Alleged causes, like overwork, mental strain, or worry, are usually assigned as the exciting factor, and in many histories no exciting cause is given. For these reasons I think it imperative that the history papers, when issued for the admission of an insane woman to an asylum, should have attached a slip containing certain leading questions bearing upon the reproductive organs, to ascertain a fuller and more satisfactory history of the previous health of the patient in this respect. We would gain additional and valuable information which is rarely given in the usual insanity certificates. If the history then pointed strongly to the presence of lesions in the genital tract, and such be demonstrated, timely and invaluable treatment could be adopted and mental and physical recovery very much accelerated.

During the past four and a half years we have at the London Asylum endeavored to secure from the friends of the incoming female patient and the family physician an account of the previous diseases (if any) the patient has suffered from, and especially all the facts concerning the number of children and of the different puerperiums. Having this information, we are then able to decide whether or not to make a gynecological examination of the insane woman. We have to date examined 187 women—recent admissions and chronic patients—and found distinct pathological lesions in 163. Of the 163 there were no less than 80 who had inflammatory lesions of the pelvic organs that were, so far as we could judge, brought about by septic invasion at the time of a puerperium. All of these 80 women had marked subinvolution of chronic metritis, and 42 had complicating diseased cervices. Some 33 had retrodisplaced uteri, and 19 had more or less serious lacerated perinea. In addition, 11 had inflammatory tubal or ovarian disease, 3 had fibroid tumors, and 1 a deep rectal fistula.

Subsequent upon suitable surgical treatment of these 80 cases we had return to physical health in nearly all, and 36, or

45 per cent, recovered mentally, and 20, or 25 per cent, had mental improvement, while the mental condition of the remaining 24, or 30 per cent, remained stationary.

From this it is evident that if septic infection is mainly responsible for the production of inflammatory conditions of the pelvic organs occurring during the puerperium, and that so large a percentage of mental recovery and improvement succeeded the removal of these lesions, it strongly emphasizes how important a factor the micro-organism is in thus directly or indirectly being the cause of many a case of mental alienation. Moreover, it teaches these valuable lessons, that too great care cannot be adopted by the accoucheur in conducting a female through the really dangerous period of the puerperium and protecting her from sepsis, and, to those having the care of the female insane, that the removal of inflammatory lesions of the pelvic organism, when found, is to open up a possible avenue of escape from mental thraldom of many of these unfortunate exiles of humanity.

THE REMOTE RESULTS OF SHORTENING THE ROUND LIGAMENTS AND HYSTEROPEXY BY VAGINAL SECTION.[1]

BY

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THE subject of shortening the round ligaments by vaginal section for retroversion has already been presented to this Society. Hence I will not discuss its technique in detail, but will briefly explain the method I have employed in 31 cases, and call your attention to the results as far as I have been able to follow them up.

I combine hysteropexy, or suture of the uterus over the bladder, with shortening of the round ligaments, and will briefly state my reasons for doing so.

The attachment of the anterior peritoneal surface of the uterus to the bladder, in such a manner as to secure peritoneal rather than connective-tissue adhesions, and thus avoid the complications during labor that follow adhesions of the latter

[1] Read before the American Gynecologica Society, Philadelphia, May 24, 1899.

variety, is now advocated and practised by Dührssen, Macken-
rodt, and Gottschalk for retroversion.

The shortening of the round ligaments by vaginal section has
been advocated by Bode, Wertheim, Vineberg, Goffe, and
others, as well as by myself, each one of us without knowledge
of the work of the others.

It has seemed to me, both from observation and reasoning,
that neither of these procedures alone can be depended upon.
We know that in cases in which hysteropexy is performed by
abdominal section, the uterus, as a result of stretching of the
perivesical connective tissue and peritoneal adhesions, sinks
down to a lower level than that at which it is sutured. Now,
as the result of distension of the bladder, the dragging of its
own weight, and of abdominal pressure, it may be expected also
to sink some after vaginal hysteropexy. But the vaginal
method does not suspend the uterus as high up as does the ab-
dominal, and it therefore requires less change in position to
constitute more or less of a retroversion; in other words, the
operation as ordinarily done could not be relied upon to hold
the fundus well forward. Although good results were appar-
ently obtained by Mackenrodt's *vesicæ fixatio*,[1] yet Gottschalk
operated eight times after Mackenrodt's latest manner, with
seven failures.[2]

On the other hand, shortening of the round ligaments by
vaginal section really means to support the uterus by the peri-
toneal adhesions formed at the places of contact of the folded
round ligaments and uterus. Such places of contact must nec-
essarily be small, because the ligament has a short circumfer-
ence and a small surface, and hence a stretching of the adhe-
sions and a recurrence of the displacement will be apt to take
place.

Therefore I have found it desirable to draw down the fundus
of the bladder and stitch the fundus of the uterus to the post-
pubic peritoneum that is drawn down after the bladder, but
which will recede upward upon being released and will draw
the fundus with it. The fundus is thus sutured to the perito-
neum over the bladder much the same as in abdominal hyster-
opexy. Other operators *may* have drawn down the bladder in
order to suture the uterus as high up as possible, but no one, as
far as I know, has called attention to suture over the bladder
in distinction from suture to its posterior surface.

[1] Berliner Klin. Wochenschr., Nos. 49 and 50, 1896.
[2] Centralblatt für Gyn., No. 14, 1899.

I have seen or heard from nearly all of the cases at periods of from three months to two years after the operation, but have not attempted to decide as to the proportion of failures that might be expected from the operation in the future. The first 31 cases can hardly be expected to do that. I have, however, heard no complaints of bladder trouble. I know of but one recurrence of the retroversion, and of two cases in which the uterus sank lower in the pelvis without complete retroversion. In my later operations I have drawn the ligaments tighter and have sutured the fundus higher over the bladder than in the earlier ones, and have not observed any failures. The uniformity of good results in the later cases has exceeded my expectations.

But the main object of this communication is to report upon the findings in 3 cases in which I opened the peritoneal cavity after the operation, and upon 1 case of labor at term.

The first case, Miss Y., was a fleshy, neurasthenic virgin upon whom I operated with only partial success, for the enlarged uterus dragged the bladder walls backward. At the same operation I curetted the uterus, and, although both ovaries were enlarged and cystic, I only removed one ovary. After seven months' treatment I removed the other ovary and the uterus per vaginam, and found that the adhesions of the bladder, round ligaments, and uterus had held, but the uterus had not been fastened high enough over the bladder and the ligaments had not been drawn taut enough. The uterus was easily separated from the bladder by means of the finger; hence I inferred that the adhesions were not intimate enough to interfere with the development of pregnancy nor the progress of labor, and that had the fundus been sutured higher up and the ligaments made shorter the uterus would have retained a normal position.

In another case (Mrs. George D.) I removed the uterus and remaining diseased ovary by abdominal section four months after the operation, and found the fundus lying in a normal position over the bladder and near the pubic bones. The ovary contained a cyst the size of an egg and hung in the cul-de-sac of Douglas, but there were no adhesions anywhere except those in front of the uterus that had been purposely made by myself. The uterus was easily separated from the bladder, but the round ligaments were held quite firmly by their new attachments to the uterus.

In the other case (Mrs. C.) the patient aborted eleven

months after the operation, in the third month of pregnancy. The suffering had been and continued to be such that I made an abdominal incision. I found the uterus in the first degree of retroversion, with extensive adhesions, although at the first operation there had been but slight adhesions. The left ovary, which was enlarged at the time of the first operation, was now converted into a cyst the size of a goose egg. I separated the adhesions, removed the left ovary, resected the right one, and performed abdominal hysteropexy without any difficulty.

I think that this case demonstrated that imperfection in technique is liable to lead not only to a failure but to untoward results. Whether the cause of the adhesions had been the oozing of blood or some slight infection at the first operation, I am unable to say. There is every reason to consider it to have been the former. The temperature remained between 99° and 100° F. during the first week, and normal after that— *i.e.*, there was no unusual reaction.

In the case in which pregnancy went to term (Mrs. L.), I removed on the 8th of January, 1897, the right ovary and tube and made an artificial opening into the closed left tube, in addition to the operation under consideration. She became pregnant in sixteen months, and at the end of twenty-five months had a natural confinement without complication. I have copied verbatim a letter written by the patient two months and a half after her confinement:

April 20, 1899.

Dr. H. T. Byford, Chicago, Ill.

DEAR SIR:—In reply to your letter will gladly answer your questions as follows:

1. Date of confinement, February 2, 1899.

2. I felt perfectly well during pregnancy, with the exception of distressed stomach, which continued the entire period. No backache nor pain at any time.

3. In labor fourteen hours.

4. The doctor found nothing unusual about my labor.

5. I am feeling very well now, but for two months after confinement I menstruated slightly every day. This was accompanied with backache and bearing-down feeling. An examination by my doctor found nothing that caused this discharge.

6. Dr. H. B. Lowry, my physician, finds the womb in its normal position and in excellent condition. There was no laceration nor rupture.

I have a nice boy; weighed ten pounds at birth.

These 31 cases have not shown as good results, as far as the

quality of the surgery is concerned, as my other work. This may be accidental, or is perhaps what might be expected of a new method. Yet we can infer that the operation, when properly done, holds the uterus in a normal position, and that, notwithstanding the fact that bladder adhesions form and persist, labor will probably not be interfered with.

The steps of the operation, which in all but one are the same as have already been published, are as follows:

T-shaped incision in anterior vaginal wall; separation of bladder from uterus; breaking up of adhesions and attention to the adnexa; drawing down of fundus of bladder and suturing of the fundus uteri above it with formalin catgut at two points about an inch apart; drawing down the round ligaments and uterine horns into the vagina, and suturing the former as taut as possible to the uterus just above their uterine insertion. As I finish the suturing of the ligament I throw the same catgut thread around the neck of the loop thus formed and tie it securely.

I regard this last step as an important detail, because the thread has a larger hold than the sutures that penetrate the ligament. I pay no attention to the rest of the loop, which contracts and forms adhesions to the bladder and uterus just below the sutures. All intraperitoneal oozing about the sutures is checked and the peritoneal opening closed with fine catgut. The vaginal wound is completely closed in the ordinary way.

In many of the cases the patients were virgins and the operations difficult, but it was always possible to complete them. I consider the result fully as good as those of Alexander's operation, and, as contraindications are more easily detected when the peritoneal cavity is open, there is less liability to failure from that source.

About the only drawback to the operation is that the exudate near the uterine horns where the round ligaments are sutured may remain tender for several weeks and make it necessary for the patient to avoid over-exertion during the second month or a little longer after the operation. This is, however, only exceptionally the case, and may be due to an imperfection in the technique.

I do not offer this method as a substitute for Alexander's operation, for when the uterus is approximately normal in size and shape and freely movable there is no operation more satisfactory than Alexander's. It is always a pleasure to

perform an Alexander operation in an appropriate case. The method in question is more difficult and somewhat more dangerous, and is to be preferred only when there are adhesions to be separated or when there is some other reason for opening the peritoneal cavity. It is only in such cases that I have adopted it, and in such cases I am constantly becoming more and more pleased with it.

MATERNAL IMPRESSIONS. [1]

BY

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THERE are numerous superstitious ideas concerning the causation of monstrosities. Some were held in the ancient and middle ages, some are held by the more or less intelligent laity to-day, and some are held by medical men even now. The last class no longer believes that monsters are sent to parents as punishment for sin, that they are the results of the artifice or wiles of the devil, or that they are the products of bestiality, but the idea is widely prevalent among physicians, especially of this country, that nervous or mental impressions occurring to the pregnant woman may in some unexplained manner influence the growth and appearance of the embryo. Scarcely a monster is reported in the periodical literature without a considerable portion of the article being devoted to speculation upon the probable maternal impression. The record of clinical and pathological facts and the report of the dissection may be wofully deficient or entirely wanting, but the metaphysical question will usually be abundantly discussed. In the rare cases where no such impression can be discovered its absence is considered worthy of note. It doubtless occurs to many that I am setting up a man of straw, but the wide prevalence of belief, even among men of our profession, in the influence of maternal impressions is my excuse for this polemic.

It may not, perhaps, surprise us to find that poetry and fiction use this theme. Goethe, Scott, and Oliver Wendell Holmes employ it in their plots, but even Fordyce Barker and Parvin urge its importance. It is perhaps worth our while to make a

[1] Read at the meeting of the Illinois State Medical Society, May 17, 1899.

critical examination of this theory. "There are more things in heaven and earth than are dreamt of in your philosophy." There is always a point in the investigation of any phenomenon where one must pause and confess his ignorance. The ancients based the world upon an elephant, and the elephant upon a tortoise, but set nothing under the feet of the tortoise. As poets and as philosophers we may theorize about the unknown, but as scientists we must base our theories upon facts and must ignore that which has no basis of proof. The causes of natural phenomena are always found to be, not mysterious and not supernatural, but always reasonable, scientific, and logical, following a law to which all similar facts and occurrences conform. Even though the ultimate causes of a fact be unknown, it is never justifiable to drag in the *deus ex machina*.

About the wonderful influences of heredity upon offspring we have nothing to do in this discussion. We may even be prepared to admit a considerable influence of mind and brain upon matter and body. Mind, however, always acts through the medium of nerves—structures material enough. Even before conception there is no reason to believe that mental impressions of mother or father could influence ovum or spermatozoon so that the resulting embryo would be deformed in a certain way at all corresponding to the mental impression. The spermatozoon with which to-day a man impregnates an ovum may have lain in his vesiculæ seminales for weeks before, as much outside the influence of his brain as is the urine in his bladder. Whatever mental impressions he may have had during those weeks could at most have influenced only those spermatozoa which were in process of formation in the testes. There is no evidence, indeed, that even these were influenced. An impression strong enough to cause an ovum to grow into a monster ought to be strong enough to exert a similar influence upon all the ova within the ovaries. Therefore all the subsequent children of that mother ought to exhibit similar monstrosities.

Let us consider the strongest case ever cited in proof of the possibility of the etiological influence of maternal impressions upon the fetus. A female monster was born in Frederick County, Md., in 1864, at the seventh month of gestation. It was a double monster of the species *diprosopus tetrophthalmus*—that is, it had a double face with two noses, two mouths, and four eyes. The ladies present, as well as the doctor officiating, accounted for the case in the following man-

ner: Ten months before the birth—that is, three months before conception—the mother lost a child by scarlatina. At the same time the mother's infant sister, about the same age as her own child, died of the same disease. Both were buried in the same coffin, and so placed that at the funeral only the two little faces were visible lying close together on the pillow. Here was a case of profound mental impression, made, not on a pregnant woman, but three months before the conception of a monster which exhibited in some respects a similar appearance to the subject which so strongly impressed her. Of course here the " impressed" ovum, if impressed at all, was influenced while still in the mother's ovary and while still a part of her body. If we will believe the homeopaths, faith-curists, and Christian scientists, we may believe that cells within the body may be influenced by mental action and by other equally imponderable factors. How can this case be considered other than a coincidence when we remember that this form of monster, although rare, yet has many times occurred in men, other mammals, and even birds, without any history of maternal impression whatever?

An early example of the belief in maternal impressions is furnished in the Bible in the story of how Jacob worked a sharp game upon his father-in-law, Laban. Jacob was promised all the ring-straked animals which should be born in the flocks under his care during a given time. Ring-straked animals were rare, and it was not expected that Jacob would make a very profitable thing out of his contract. However, the astute son-in-law peeled the bark from twigs in the form of rings and set these twigs up near the places where the animals went to drink, so that they might "conceive before the rods." He took pains, too, to set the rods only where the best and strongest sheep and cattle were, having an eye upon quality as well as quantity. The result was that most of the females, and those the best ones, bore ring-straked young, much to the profit of Jacob.

The pigmented spots, moles, and nevi which are so common are popularly supposed to be the result of maternal marking. A woman saw a mole run under her bed, and when her child was born it had a hairy mole of considerable extent on the forehead, covered with fine brownish fur just like that of the mole which ran under the bed. As a rule the supposed marking is observed on the child, and then everybody thinks hard to discover something in the history of the pregnancy to which the marking may be ascribed.

It is the usual rule for writers reporting cases of monstrosity to make some reference to the probable maternal impression which caused the deformity reported. Great ingenuity is often displayed in ferreting out, in the history of the pregnancy, some fright or mental shock which is indicated as the cause of the phenomenon. Since anencephali are by far the most common of monsters, and since, from the lack of a cranium, their foreheads recede abruptly from above the eyes, thus giving the appearance of the head of some animal, like a dog, cat, or frog, it is usual to find in the history of the case that the mother was frightened or shocked by seeing some such animal under some frightful circumstances.

Dr. Stahl, at a recent meeting of this Society, read a paper on this subject in which he used as an illustration of the possible occurrence of deformities resulting from maternal impressions a case of anencephalus which had occurred in his practice. The mother, in the third month of her pregnancy, saw a child run over in the street. The top and back of its head were crushed and mangled into a bloody pulp. The sight naturally caused a profound nervous impression on the mother, and the image of the mangled child was doubtless imprinted sharply on her memory for a long time. When her own child was born it proved to be an anencephalus. The bones of the cranial vault were lacking, and the base was covered only by a red mass of rudimentary cerebral tissue and membrane. He accounts for the malformation by supposing that the mental shock caused a sudden spasm of the muscles, including those of the uterus, so that the embryo was for a moment slightly injured or the blood supply was temporarily impaired. Certain of the cells at the cephalic end of the embryo were thereby killed, thus causing the ultimate defect in the cranial vault seen at birth. How a muscular spasm of the uterus insufficient to cause abortion could exert any deleterious influence on the minute embryo snugly tucked away in the centre amid the fluids of the ovum is hard to conceive. Even so, why should the cells of the cephalic pole of the embryo alone be affected, so that the resulting fetus should bear a resemblance to the mangled child, instead of the cells of the great toe or some other part of the embryonic cell mass?

Such cases as the following are not uncommonly met with in the literature. The reporter delivered a woman of an anencephalus at the seventh month and put it in a jar upon his office table, where another woman, pregnant about ten weeks,

saw it as she came to consult the doctor. She is said to have been much frightened and shocked at the sight of this " imp staring her in the face." Six weeks later she miscarried, giving birth to a four-months fetus, also an anencephalus of the same type as the former. The author has them pictured convincingly side by side. He naïvely states that he could get no history of maternal impression in the first case.

A case of so-called " kynocephalus " was reported within a few years in Chicago, where the maternal impression was due to the mother being frightened and bitten by a dog. When the child was born its head was supposed to resemble that of a dog; hence the name coined. To make the thesis more conclusive the skulls of dog and fetus were shown side by side.

While two months pregnant a woman saw a pet kitten torn and mangled by a dog. This horrible sight caused her much mental shock. The inevitable old woman prophesied that a monster would result. At four and one half months the woman aborted, giving birth to a *hemimelus anencephalus.* Each limb ended with the first bone, and the entire vault of the cranium with its contents was wanting. Of course the reporter agreed with the old woman that the impression caused the monster. The kitten's legs were partly torn off by the dog, and that accounted for the hemimelus; while the fact that the terrifying object was a cat accounts for the anencephalus, which made the head look something like that of a cat.

In the first place, the theory of maternal impressions should explain all cases. In spite of diligent search into the former history of the pregnancy, in most cases no event is found which could account for the presence of the particular anomaly under consideration. Thousands of anencephali and other monsters are born without the possibility of the most diligent inquiry eliciting any story of fright by cat, frog, or other animal, or indeed any unusual occurrence during the pregnancy. Conversely, all cases of fright or nervous shock during pregnancy should be followed by the birth of a monster, or at least of a child showing some anomaly. Comparatively few women, especially susceptible as they are to nervous stimuli on account of the pregnancy, go to term without at some time having a mental shock or a fright at least as great as most of those reported as evidences of maternal impression. As a matter of fact, monsters and even slight anomalies are rare when we consider the number of children born every day.

If maternal impressions had any etiological influence upon the production of monsters, the kinds and classes of such monsters ought to bear a relationship to the kinds of impressions that produced them. We should not expect that monsters would exhibit species and genera according to definite scientific laws, as they undoubtedly do, but should rather expect that there would exist monsters looking like dogs, corresponding to the mothers who were startled or " impressed " by dogs, others like cats, others like elephants, and so on *ad absurdum*. As a matter of fact, monsters and anomalies follow as definite laws of etiology and classification as do any other natural phenomena. How shall we account for certain purely internal malformations, perhaps of organs which the mother did not know existed? As examples are to be mentioned diaphragmatic herniæ, transposition of viscera, bifid uterus, supernumerary spleen, or cardiac anomalies.

Now, embryology teaches us that certain organs and parts begin and attain their development at certain different and definite times during gestation. The same cause acting at different times upon the same part of the embryonic cell mass will have vastly different results. It is hardly conceivable that a mental impression of the mother would be able to influence the form of the fetus to the extent of removing structures already formed. Thus the sight of a one-eyed man during the middle of pregnancy could hardly be expected to cause one of the eyes already formed to disappear, leaving only one, and that in the middle of the forehead, as in Cyclops. Yet we know that the eye vesicles begin to bud out from the cerebral vesicles, one on each side, during the first fortnight. So with most of the anomalies. The organ in question is usually far on in its development and beyond the reach of any deterring influence during the early weeks or even days of gestation, while most of the maternal impressions reported occur late in pregnancy. Most women do not know that they are pregnant before one or two months have passed, and therefore are not on the alert to remember the mental impressions occurring during the early weeks.

If it is hard to conceive how mental conditions of the mother could remove any part of the embryo, it is even more inconceivable how they can add anything. How can the redundant anomalies, the supernumerary organs or digits, but especially the double monsters, be accounted for by the theory of maternal impressions? There is a normal fetus in the uterus; in the

midst of the pregnancy the mother sees two dogs joined back to back in coitus, and in due time there is born a pygopagus, a double monster united at the nates. In their time the famous Hungarian sisters were thus accounted for.

If maternal impressions explain human anomalies they should also explain such occurrences among the lower animals and even among plants. Monstrosities are perhaps more common among domestic animals and fowls than among men. They are even relatively common among reptiles, fishes, insects, not to speak of nuts, oranges, and corncobs. The hen that laid the egg from which was hatched the monstrous chick may have gone to the pot long before the egg was set under another hen or perhaps under a turkey. Indeed, there is a greater propor- tion of monstrosities from eggs hatched in incubators than under the birds themselves. Is not the mammalian or even the human ovum, from the moment of impregnation or from the moment of its escape from the ovary, as much outside of the influence of the mother's body, except for nourishment, as is the egg of the fowl or the fish? The placental villi commingle with the greatest intimacy with the glandular tissue of the uterus, but at no time or place does the maternal tissue coalesce with that of the fetus, nor even does the mother's blood reach the veins of the offspring. How, then, can any nervous stim- uli, even of some obscure trophic character, reach the growing embryo from the brain of the mother?

The strongest blow is dealt to the theory of maternal impres- sions by the results of experiments in the production of monsters artificially. Innumerable experiments have been performed upon the eggs of bird, fish, insect, and echinoderm which have resulted in the production of almost all the typical varieties of monsters, especially of single monsters. Different varieties can even be produced at the will of the experimenters by different ways of managing the eggs. Monstrosities can be artificially produced in the embryos of birds exactly like those which, oc- curring in human fetuses, are ascribed to mental shock or ner- vous impression of the mother. It has often been observed that fish eggs hatched in running water produce a far greater pro- portion of double embryos than do those hatched in still pools. The shaking caused by railroad or wagon journeys to the hatchery also results in a greater profusion of double mon- sters. In human fetuses, even at full term, there are sometimes found remains of amniotic bands and adhesions which obvi- ously, by interfering with development of different parts at an

early period of gestation, were the causes of various malforma-
tions. In short, all malformations and monstrosities can be
explained by purely physical and mechanical causes, entirely
remote from psychic influence, so that there is never any reason
to invoke the mysterious or the supernatural to explain natural
phenomena.

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VAGINAL CELIOTOMY:
WITH REPORT OF ELEVEN CASES.[1]

BY

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Hospital.

ALTHOUGH the topic of this paper has been discussed by
several of our ablest Fellows during the last few years, yet its
great importance will perhaps offer a sufficient excuse for the
writer offering his own small experience of eleven cases as a
contribution to the literature of the subject. It was at Belle-
vue Hospital about five years ago that the writer first saw an
ovary removed by the vagina by Dr. Polk. On his return to
Montreal a few days later he found a patient awaiting him at
the Western Hospital who had a large, tender, and prolapsed
left ovary in Douglas' cul-de-sac. This patient had been treated
for over a year at the Montreal Dispensary with iodine and
boroglyceride tampons, etc., but continued to grow steadily
worse. She had always declined operation on account of the
necessary cutting open of the abdomen, which she dreaded
very much; but when told that she could have it removed
without having any external incision made, she readily con-
sented. This was the writer's first experience with vaginal
celiotomy, and an easier or more suitable case could hardly be
found, for on cutting through the posterior cul-de-sac the ovary
bulged into the incision and with the tube was easily removed.
This patient made a remarkably quick recovery, and could
have left her bed and gone out two days later if she had been

[1] Read before the American Gynecological Society, Philadelphia, May
23, 1899.

allowed to do so. As she felt perfectly well at the end of ten days, she was allowed up, and she went home in twelve days perfectly well and has remained so since.

The experience in this case was so gratifying that on being called in consultation with Dr. Valin to a lady at Lachine, nine miles from Montreal, who was still in bed with a high temperature one month after her confinement, and a diagnosis of a pus tube lying in the back of the pelvis having been made, abdominal section was advised, but declined by the patient. Her physician suggested a vaginal section, and this was agreed to readily both by the patient and the writer. She was brought in the ambulance to a private room at the Western Hospital, and next day vaginal celiotomy was performed by opening into Douglas' cul-de-sac. The diseased tube proved to be larger than it was thought, and it extended much higher up, so that he was obliged to tear the vaginal opening a little wider. The tube proved to be not only densely adherent, but very friable, so that it broke and a large quantity of pus poured out. The hemorrhage was now considerable, and, after making the most strenuous endeavors without being able to enucleate the pus tube, he was obliged to sew up the vagina and complete the operation by abdominal section, but even then with the greatest difficulty. The patient never rallied; her urine came away involuntarily owing to a tear of the ureter, and she died three days later with a low temperature and a high pulse. No postmortem could be obtained, but it was the opinion of the hospital staff that if she had been operated on by the abdominal route only, she would have recovered.

The writer was so discouraged by the result in this case that he abandoned vaginal celiotomy until last autumn when he returned from a visit to some leading European gynecologists. Although two of the best known of them, Ségond of Paris, and Jacobs of Brussels, had practically abandoned vaginal celiotomy ever since their visit to America, still he saw so much of it done by Martin, Landau, and Dührssen of Berlin, and was so favorably impressed with its advantages in certain cases, that on his return home he began to employ it again.

On August 28, at the Samaritan Hospital, he performed a vaginal removal of pus tubes and ovaries and vaginal fixation on Mrs. D., 28 years of age, who had been a sufferer for five years—ever since her marriage, when she contracted gonorrhea. She was sterile, suffering from dysmenorrhea which compelled her to take to bed, dyspareunia, and painful locomotion. She had been treated by him off and on for nearly a

year, and the writer knew that these symptoms were due to a retroverted uterus with fixation, and that this fixation was due to pelvic peritonitis, which was in turn due to leakage of pus tubes. One ovary would have been left in had they not been both small, hard, and contracted, and it was feared that doing so would imperil the success of the operation for the cure of dysmenorrhea. It was with great difficulty that these ovaries were dug out of their bed of dense adhesions, and all the assistants remarked that it would have been easier and quicker to have removed them by the abdomen in the Trendelenburg posture, but it seemed worth while to have taken this extra trouble in order to avoid the scar in the abdomen of a young woman. She made a good recovery, although she suffered a good deal for a couple of days.

CASE IV.—On September 9, 1898, at the Western Hospital, vaginal celiotomy was performed on Mrs. H., 24 years of age, for retroversion with fixation. She also suffered from an irritation about the vulva and a profuse discharge from the uterus as well as from menorrhagia. There was also a severe bilateral laceration of the cervix. She was dilated, curetted, had an inch of the cervix amputated, and the anterior vaginal wall opened and the left tube and ovary, which were in a very bad condition, removed. The right tube also contained pus and was removed, but the right ovary was allowed to remain. The uterus was then fixed to the vagina in anteversion. This patient suffered hardly any and made a rapid recovery. As a number of cases from whom he removed double pus tubes a year ago, but allowed one or both ovaries to remain, have made splendid recoveries, he felt much encouraged to continue this conservative work, more especially as the pus tubes can be removed through the vagina. The patient is cured of her pain, and has none of the discomforts of the premature menopause, and no scar in the abdomen to tell her or any one else that she has undergone this serious operation. Indeed, he even hopes that by using catgut to tie the tubes, or by not tying them at all, and by dilating them if they are closed, some of these women who were sterile before may become pregnant without the aid of the tubes.

P. S.—Since writing the above he adopted this plan in one case, but with disastrous results, as will be seen when we come to it.

CASE V.—On September 22, 1899, at his private hospital, the writer performed vaginal celiotomy on Mrs. F., age 20,

a patient of Dr. Germain's, who brought her on account of severe hemorrhage every month. She had a badly lacerated cervix, a retroverted and fixed uterus, and large and tender ovaries and tubes. After curetting and the application of iodine and carbolic acid to the endometrium, and after Schrö-der's amputation of the cervix, the anterior vaginal wall was opened between the bladder and the uterus and a right pus tube and ovary were removed. The left tube was also full of pus and was taken out, but the left ovary, after being cleaned up, was allowed to remain. While freeing the ovary and tube he also freed the uterus and brought it forward and fixed it to the vagina. This patient made a rapid recovery, and could have gone home on the third day, but was kept in the hospital two weeks.

CASE VI.—Mrs. H., 36 years of age, was suffering in a marked degree from retroversion with fixation, the most prominent symptoms being the menorrhagia, headaches, and pain in the back. There was also obstruction of the bowels from mechanical pressure of the fundus on the rectum. On February 2, 1899, at private hospital, she was curetted, the anterior vaginal wall opened and the adhesions easily broken up, after which the uterus was brought forward and stitched to the anterior vaginal wall. The interesting point in this case was that she had neither vomiting nor pain after the operation, and was so well that she was allowed up in six days and went home in eight days. She has been seen since and is perfectly cured. The tubes were closed, but nothing was done to them or the ovaries except to free the adhesions, which were neither extensive nor very dense.

CASE VII.—On November 12, at the Samaritan Hospital, vaginal celiotomy was performed on Mrs. McL., age 38, who had been under the writer's care at the Montreal Dispensary for several weeks for a pain in her left side. She had missed a period and then had irregular hemorrhages. A tube as large as a sausage could be distinctly felt in the left side by manual examination, so that there was no difficulty in diagnosing a tubal pregnancy. The operation was very easy, and, as the left ovary was very strongly adherent to the tube, it was removed at the same time. She vomited steadily for a week, but with the exception of this distressing symptom all went so well that she was discharged cured in three weeks. She has been seen since in good health. Microscopical examination showed the presence of chorion.

CASE VIII.—On April 15, at the Western Hospital, Miss M., 19 years of age, underwent vaginal celiotomy for pus tubes. She was a dressmaker, and had the misfortune when only 17 to be seduced and infected with gonorrhea at the same time. For the last few months her health had been failing, and she had so much pain in her back and sides that she was compelled to give up work. On examination the ovaries and tubes were found adherent under the retroverted and fixed uterus, from which there was much purulent discharge. For this she was thoroughly curetted, and then the anterior vaginal wall was opened and the tubes and ovaries and the uterus brought out with some difficulty—not because the adhesions were dense (for, on the contrary, they were easily separated), but on account of the size of the uterus, which was double the normal. The angry appearance of the tubes and the white lymph on the fimbriæ gave cause for anxiety. As the patient expected to be married and begged that her ovaries might be left, her wish was complied with, but the half of one tube and the whole of the other were removed. In order to give her a chance to become pregnant, the peritoneum was sewed to the mucous membrane near the cornu, and no ligature was put on this stump, so that a clear road was left into the uterus. The other tube was tied and the outer half of it removed. The uterus was then brought forward and fastened to the anterior vaginal wall. Douglas' pouch was cleaned out as well as possible under the circumstances, but not as well as could have been done by the abdomen. The patient did so well during a week that the writer felt enthusiastic over this method; but soon after she began to complain of pain in the pelvis and her pulse and temperature began to rise. She was carefully examined and the vaginal wound washed with bichloride, but that was evidently not the cause of the trouble. Two days later a solid exudation was felt in the vaginal vault completely surrounding the uterus. It was hoped that this would have remained localized and been gradually absorbed. As she was getting worse, a second operation by the abdomen was proposed, but this was abandoned lest she might not live through it, her pulse being so fast and weak. That night the temperature dropped and the pulse shot up to 160, and it was evident that the case was hopeless. At the postmortem the intestine was found matted together and the abdomen full of pus right up to the liver. It was the general opinion that if this case had been operated by the abdomen the result would have been different.

CASE IX.—On April 20 Mrs. D., 21 years of age, was operated on at the Samaritan Hospital for retroversion with fixation. She was married at 19 and had been suffering ever since from attacks of pelvic peritonitis. As she was growing worse steadily, she agreed to have the uterus fixed forward. This seemed a good case for vaginal celiotomy, as the tubes and ovaries were not very large. An incision was made in the anterior vaginal wall, and during the next half-hour every effort was made to detach the ovaries and tubes from Douglas' cul-de-sac, but in vain. The writer was all the more loath to abandon this route because there were present a large number of physicians who had been invited to witness the advantages of vaginal laparatomy. When it was found that it was utterly impossible to free the ovaries and tubes, the vagina was sewed up and the abdomen was opened, and after five or ten minutes of hard work the appendages were released and the fundus brought forward and stitched to the abdominal wall with two permanent silkworm-gut stitches. The patient made a perfect recovery and went home in four weeks looking and feeling well. In spite of all the force used during the two operations, she suffered very little pain and had no rise of temperature.

CASE X.—On February 12, at the Samaritan Hospital, vaginal celiotomy was performed on Mrs. S., 40 years of age. She had been a sufferer for many years from pain in the back and headache, and latterly from constant straining or bearing down and profuse menstruation. The uterus was large, retroverted, and fixed, and there was a badly lacerated cervix. She was therefore dilated and curetted, her cervix was removed by Schröder's method, the anterior vaginal wall opened, the adhesions freed, and the uterus fixed forward. She was discharged cured in two weeks, and returned at the end of four weeks to have the fixation stitch removed. She claimed that she felt perfectly well, but on examining her the uterus was found slightly retroverted, although it was firmly fixed to the anterior vaginal wall, which, however, it carried with it. This case gives me some ground for thinking that vaginal fixation may not be so reliable in its results as ventral fixation.

CASE XI.—On February 13, 1899, vaginal celiotomy was performed on Mrs. M., sent to the Samaritan Hospital by Dr. Grant Stewart. She was 33 years of age, and ever since the birth of her first child ten years ago she had suffered from headache and backache; her menstrual periods came on twice a month and were profuse. She received the same treatment

as the previous case, namely, dilatation, curetting, amputation of a large lacerated cervix, and vaginal fixation. The day after the operation she said she felt better than she had done for many years, and she has been seen since and is steadily improving from the shattered condition in which her nervous system had so long been.

Technique.—Where should we make the incision? There is a great difference whether we make the opening through the anterior or posterior vaginal wall. Each has its advantages. The author saw a good deal of this work last summer by Dührssen, Martin, and Landau of Berlin, and they always opened the anterior vaginal wall, starting from an inch back of the meatus and ending half an inch in front of the cervix. In some cases this would give much too small an opening, and it may therefore be enlarged by a cross incision two inches wide at the cervical end of the first. Dührssen, who claims to be the inventor of vaginal fixation, having published his first 15 cases before any one else had published any, is an enthusiastic advocate of it. The writer has seen him perform this operation three times within an hour. He opens into the peritoneal cavity in two minutes or less, hooks out the ovaries, tubes, and uterus, destroys all cysts by ignipuncture, replaces them, and passes a silkworm-gut ligature through the vagina, peritoneum, uterus, and out again on the other side through peritoneum and vagina. This is left untied until he has sewed up the opening in the peritoneum with a running catgut and the vagina with another row of running catgut, after which the fixation ligature is tied. Martin was greatly assisted in his work by an instrument of his own, a volsella, the back blade of which is a sound and the front one a double hook.

Indications.—Vaginal celiotomy is a great boon for women who require to have their abdomens opened for one of the minor diseases of the tubes and ovaries. In several cases the writer has opened up closed tubes, resected sclerotic and cystic ovaries, removed both ovaries and tubes, or removed both tubes and left in one or both ovaries or a part of one ovary. It may take the place of ventrofixation in minor cases of retroversion where the adhesions are not very dense. We are not justified in doing it when there are no adhesions, because Alexander's operation will give even better results without opening the peritoneal cavity. When the adhesions are dense, vaginal fixation is a much more difficult operation than abdominal section,

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for two reasons: first, because we have to work in the dark in-
stead of seeing what we are doing by means of the Trendelen-
burg posture; and, second, because the fingers are not long
enough to reach the upper part of the adhesions without remov-
ing the uterus. In two of his cases the author was obliged to
abandon the vaginal method and finish the operation by an
abdominal incision. Therefore, before deciding upon vaginal
celiotomy, it is important to make a careful bimanual examina-
tion under anesthesia. In well-selected cases the operation
gives excellent results, but in those in which there is extensive
disease of the appendages and dense adhesions vaginal celi-
otomy will almost surely be followed by disappointment and
disaster.

*Vaginal Celiotomy for Retroversion when the Uterus is
Movable.*—The writer would dismiss this part of the subject
with the simple assertion that for such a condition the opera-
tion is not only not indicated, but unjustifiable, were it not
that one of our ablest members has written on page 373, vol.
xxiii. of our Transactions, the following paragraph in the
course of a very interesting article "On the Surgery of Uterus
and Adnexa per Vaginam": "The results in the Alexander
operation and in fixation of the uterus to the abdominal wall
have been so unsatisfactory that the consensus of opinion will
undoubtedly lead the profession ere long to abandon them and
substitute the operation performed and described by Dr. Rid-
dle Goffe" (shortening the round ligament through the vagina).
The writer takes exception to this statement that the results of
Alexander's operation and ventrofixation have been unsatisfac-
tory; on the contrary, they have given the writer the most sat-
isfactory results. If there are no adhesions and the uterus is
freely movable, one is not justified in opening the peritoneal
cavity either by the abdomen or by the vagina in order to shorten
the round ligaments. Alexander's operation is easy, quick, safe,
and reliable. The writer has had no failures in his last hun-
dred cases; in no case has hernia occurred, nor would it be pos-
sible for it to occur after the operation as he performs it. The
ligament can always be found; and even if we have the misfor-
tune to split it and thereby break it, it can easily be picked up
further along the canal, or even in the broad ligament, where it
is sometimes as thick as the little finger, without opening the
peritoneal cavity. Admitting that the danger of opening the
peritoneal cavity with our present almost perfect technique is
very small, still the danger is ever present. Every one will

admit that if we can as surely cure the patient without opening the peritoneal cavity, we should certainly avoid the major operation and give the preference to the minor one. The writer therefore differs from our learned brother, and stoutly maintains that Alexander's operation has given him the greatest possible satisfaction, only equalled, in fact, by ventrofixation.

Vaginal Celiotomy for Retroversion when the Uterus is Adherent.—This is a different matter and requires careful consideration. In this case the abdomen must be opened in order to free the adhesions. We may begin by admitting that it is a great advantage to the patient to have it opened by the vagina, because it avoids the scar and because there is less pain and nervous shock; but, on the other hand, we must remember that in fixing the uterus to the vagina we are anchoring it to a movable point, very different from the fixed point to which we attach it in ventrofixation. This latter operation has given the writer more satisfaction than any other operation he has ever performed. In 130 cases there have been only four failures to hold the uterus up to where it was attached. Fully a hundred of these cases have been examined from one to seven years afterward, and, with the above few exceptions, the fundus was found attached to the abdominal incision. In one case a few days ago the writer had occasion to remove a uterus which had been ventrofixated by him a year ago, and with all his strength he found it impossible to drag it down and was obliged to cut the fundus away from the abdomen. Pregnancy after ventrofixation is so rare, because the appendages are always diseased when the uterus is fixed, that we need not take that into consideration; and if the anterior surface of the uterus is scarified and fastened to the abdominal wall with two well-boiled silkworm-gut sutures, the result will almost invariably be most satisfactory. We may also dismiss the possibility of ventral hernia. In thin women the writer uses through-and-through silkworm-gut sutures, which are left in a month; in stout women the muscle fascia and peritoneum are closed with buried silkworm-gut stitches, which are left in forever, and the fat and skin are closed with another layer of silkworm gut, which is left in a week. Another point of great importance is this: in most cases of retroversion with fixation there is already some prolapse of the uterus, and vaginal fixation is of no use in such cases, because we would be fixing the uterus to something which itself is not fixed but sometimes exceedingly movable. The anterior vaginal wall sometimes prolapses just as much as the uterus

does; for this reason, especially, vaginal fixation is not to be compared with ventrofixation.

Should we remove pus tubes by the vagina? The answer depends entirely upon the size of the tubes. If they are small, not larger than the finger, and the inflammation is not too recent, and they are situated low in the pelvis, they may be removed by the vagina. If they are large and situated high in the pelvis, and we have reason to believe that they are adherent to the bowels or vermiform appendix, it is impossible to remove them without first removing the uterus. It is true that one of the advantages claimed for the vaginal removal of pus tubes is that it necessitates the removal of the uterus and thereby secures better drainage for the swollen and infiltrated broad ligaments. But the writer and many others are opposed to the total removal of the uterus, even when both tubes and ovaries have been removed. The moral effect is bad, and, physically, owing to the shortening of the vagina, the woman is quite unfitted for married life; while, on the other hand, the writer knows of many women who have had both ovaries and tubes removed, who have not only continued for many years to perform their conjugal duties, but have retained, and even in a few cases experienced an increase in, their sexual feelings. Out of more than one hundred cases in which double pus tubes were removed, in only three did the writer regret for a time not having removed the uterus, because a profuse acrid discharge continued to pour forth from it. But even these women, after two or three years, were completely cured by a second curetting. In one of the three the discharge continued some months after the second curetting, and it was decided to remove the uterus when he returned from Europe last fall. But during his visit he mentioned the case to a leading gynecologist (Ségond), who advised him not to remove the uterus, and assured him that all would yet be well. On going to see her on his return she assured him that she was perfectly cured and never remembered having felt so well in her life. She was very thankful that she still remained in possession of her womb. This patient had acquired pus tubes at the time of her marriage, and had never been able to perform her marital duties without pain until the pus tubes were removed, since which it is quite the contrary. But even admitting that the uterus must come out with the pus tubes, it is sometimes even then a most difficult undertaking to remove large pus tubes by the vagina. The author has seen both Ségond and Landau do

it, but the former has now abandoned it, and the latter could have removed the pus tubes without sacrificing the uterus, and much more easily, by the abdomen than by the vagina. There is another point to be kept in view, and that is the effect of the clamps on the broad ligament. Any one who has seen these large pus tubes removed by the vagina will admit that it would have been impossible to have used ligatures. Jacobs, who has performed seven hundred vaginal hysterectomies, with a death rate of less than two per cent, has abandoned the operation. When I asked him why he had abandoned hysterectomy with clamps, in which he had been so remarkably successful, he replied: "Because with the clamps you compress the nerve and cause the woman so much suffering for two days that it takes her two weeks to get over it, while if you tie only the arteries and close up the peritoneum she will be practically well next day."

Conclusions.—Although the author's experience has been limited to eleven cases, yet these have been such instructive ones that he has been enabled to arrive at the following definite conclusions as to the relative merits of, and indications for, vaginal celiotomy.

1. Vaginal celiotomy is indicated in retroversion with fixation, in minor diseases of the ovaries and tubes, and in small fibroid tumors of the uterus. But in the author's experience the vaginal method of freeing the retroverted adherent uterus is on the average more difficult than the abdominal method, and vaginal fixation is not so reliable in curing the retroversion and prolapse as in ventrofixation.

2. If the uterus be movable and there are no adhesions to be broken up, one is not justified in opening the peritoneal cavity either by the abdomen or the vagina in order to shorten the round ligaments. In such cases Alexander's operation is easy, quick, safe, and more reliable. The author has had no failures in his last hundred cases.

3. For the removal of pus tubes the operation by the vagina is more difficult than by the abdomen, in all cases excepting those in which the uterus is removed at the same time. When the uterus is split in half, and each half is removed with its corresponding ovary and tube, and when clamps are used, the vaginal operation is easier than the abdominal in which ligatures are employed. The vaginal operation is a little safer on account of the drainage which it affords, but, on the other hand, it offers more risk of injuring the ureter. The author is

opposed to the removal of the uterus, even when both ovaries
and tubes have been removed, owing to the bad moral and
physical results; and he is opposed to the use of clamps as
compared with ligatures, because, although easier and quicker,
the clamps prolong the convalescence owing to the bruising of
the nerves in the broad ligaments.

4. For the removal of chronically inflamed ovaries and tubes
vaginal celiotomy has the following decided advantages: (*a*) It
is less dangerous, because the intestines are not exposed to
the air or to bruising by the hands or infection through dis-
eased tissues passing over them so much as when the latter are
removed by the abdomen.   (*b*) Vaginal celiotomy is less pain-
ful, the incision in the vagina causing almost no pain, while
the abdominal incision and stitching are exceedingly painful.
In vaginal celiotomy morphine is rarely required; in abdominal
celiotomy it is cruel to deprive the patient of it, although we
know that her convalescence is prolonged by its use.   (*c*) There
is no telltale scar after vaginal celiotomy, which is sometimes
a matter of great moment to young single women who intend
to marry.   The presence of the scar has to be explained, and
the patient is suspected of having been unfitted for marriage
by the removal of both ovaries, when in reality one or both
ovaries remain.   (*d*) The danger of hernia.   Although the
author has had no case of hernia during the last three years,
owing to his method of suturing and leaving in the silkworm
gut either permanently or at least a month, and he considers
this accident entirely preventable, yet for those who meet with
it its possibility should have great weight in balancing the
merits of the two operations.   There is no hernia after vaginal
celiotomy.

5. Much good conservative work on the ovaries and tubes,
and even on the uterus, can be performed by vaginal celiotomy
with almost no risk or pain to the patient.   The uterus and
appendages can be brought out at the vulva through an open-
ing in the anterior vaginal wall, and cysts can be excised or
burned out; one-half of one ovary can be amputated and the
remaining bivalvular flaps neatly brought together with fine
silk or catgut; the closed tubes can be opened or a piece of the
pavilion removed and a probe passed into the uterus, and the
mucous and peritoneal layers of the remainder of the tube
brought together with interrupted catgut sutures; and small
fibroids, not larger than the normal uterus itself, can be cut
out and the hole in the wall of the uterus closed with two or

three rows of fine sutures. But it is very dangerous to open up closed tubes as long as there is any active inflammation or infection going on, because by so doing we break down the wall of defence made by Nature around the infected tubes to save the general peritoneal cavity from invasion.

6. Tubal pregnancy before rupture and not later than the sixth or eighth week can be readily removed by vaginal celiotomy; the author had one successful case compared with twelve successful cases by the abdomen. But vaginal celiotomy is contraindicated when the pregnancy has advanced to twelve weeks or has ruptured into the abdomen. In several of the author's cases the vermiform appendix was diseased and adherent to the tube, for the removal of which abdominal celiotomy was essential. In several others of the author's cases the abdomen was full of clots as high up as the liver and the fetus was floating among the bowels higher than the umbilicus. These cases could not have been successfully operated by the vagina.

7. In general terms, all cases in which the trouble is small in size and located low down can and should be operated by vaginal celiotomy, while everything large and located high up should be reserved for abdominal section.

250 BISHOP STREET, MONTREAL.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

TWENTY-FOURTH ANNUAL MEETING, HELD IN PHILADELPHIA, MAY 23, 24, AND 25, 1899.

JOSEPH TABER JOHNSON, M.D., *of Washington, D.C., in the Chair.*

First Day—Tuesday, May 23.

The meeting was held in the hall of the College of Physicians.

ADDRESS OF WELCOME.

DR. EDWARD L. DUER, of Philadelphia, delivered the address of welcome. He said that gynecology was without doubt of American parentage. In its early infancy this Society had become sponsor for it, and hence much of the good work of gynecologists must be credited to the fostering care of the Society which Philadelphia was now pleased to welcome.

SIXTY-FIVE CONSECUTIVE ABDOMINAL SECTIONS WITHOUT A
DEATH, WITH CLINICAL AND PATHOLOGICAL REPORTS.

DR. HUNTER ROBB, of Cleveland, read this paper. The
sixty-five cases upon which it was based were entirely unse-
lected. The author stated that, in order to carry out with any
degree of certainty an aseptic technique in all operations, it
was necessary for the surgeon to have a properly organized
staff. As a rule the first assistant stood opposite the operator
and helped him directly, handing to him the instruments and
sponges. The second assistant or the nurse, stationed on one
side of the table, took charge of the instruments. The third
assistant looked after the sponges or dressings and made cul-
tures or microscopical examinations, when necessary, during
the operation. The fourth assistant devoted himself to the
administration of the anesthetic. Whenever possible the pa-
tient should be kept under observation for a few days prior to
operation, and during this period the bowels and diet should be
regulated. After describing the method of preparing the field
of operation, attention was directed to the importance of having
the patient so clothed as to effectually prevent chilling. He
had found it necessary for both the surgeon and his assistants
to wear in the operating room sterilized suits, made of twilled
muslin, and canvas shoes with rubber soles. It was also
desirable that a small sterilized muslin cap be worn, in order to
avoid the possibility of dandruff from the head coming in con-
tact with the wound. It was his custom to make use of gauze
"sponges," as they could be easily sterilized by steam, and the
same one would never be used for another operation. The
gauze should be cut into different sizes, and the edges folded
over and hemmed so that no loose threads would be left in the
field of operation. Irrigation was done only with normal salt
solution, a quantity of which was poured into the abdominal
cavity directly from the glass graduates. In his cases the
wound was dusted with a powder composed of one part of
iodoform and seven parts of boric acid. He had not employed
glass drainage tubes for the past five years, preferring, when-
ever it was necessary to drain at all, to use strips of plain
sterilized gauze. Such drainage was especially appropriate in
those cases in which there had been a rupture of the bowel and
it had been very difficult to close the tear. After every abdom-
inal section he washed out the abdomen with sterilized salt
solution and left from 300 to 500 cubic centimetres in the
abdominal cavity. The patient was then kept with the head
low for twenty-four hours, as advised by Clark. On being put
to bed after the operation she received an enema of one ounce
of black coffee, and this was repeated in one hour. Every
three hours thereafter a nutritive enema was given, consisting
of twenty grains of common table salt, the whites of two eggs,
and one ounce each of whiskey and peptonized milk. His
patients had rarely complained of much thirst following the
operation, but where they did so he relieved it by giving sips

of hot water at intervals of one or two hours, or by an enema of 500 cubic centimetres of tepid water, repeated several times during the twenty-four hours. Where there was much nausea complained of after the first or second day, it could be sometimes relieved by giving two or three tablespoonfuls of very hot water in which ten grains of bicarbonate of soda had been dissolved. This should be repeated every hour or two until the nausea ceased, or its action might be supplemented by the application of a mustard leaf to the epigastrium. He did not use morphia or any of its derivatives as a routine measure after abdominal operations. As a rule the bowels were opened on the second day, usually by giving 2 grains of calomel, and eight hours later a high injection of 2 ounces of glycerin, followed in two hours by another injection of 1 pint of warm soapsuds. As a rule the patients were catheterized every eight hours. While he preferred to keep the patient on the back for the first twelve hours after operation, yet, if there were much complaint on this score, she could be well supported on the side for five or ten minutes at a time. Tympanites could be relieved in many instances by the use of the rectal tube, but if this did not succeed an injection of sweet oil, warm water, and turpentine should be used. The speaker said that he felt that the avoidance of serious septic infection in this series of sixty-five cases was dependent upon careful technique, not the least important parts of which were the wearing of rubber gloves and the flushing of the abdominal cavity with warm salt solution. The average duration of anesthesia had been two hours and nine minutes, and the average length of the operation one hour and thirty-eight minutes. Suppuration of the abdominal wound had occurred in three instances. In only one case had drainage been used. The average length of time in hospital had been thirty-two days. Pus had been found at the time of operation, macroscopically in eight cases and microscopically in ten cases.

Dr. J. Montgomery Baldy, of Philadelphia, said that he had found morphia very useful when given the first night after the operation. As to the use of sponges, he would say he knew of nothing else that could equal them in absorbent power. He had compared his results with those obtained by his colleagues who used gauze, and could see nothing from such a comparison unfavorable to the use of sponges. The employment of rubber gloves certainly seriously impaired the tactile sensibility of the operator, and if the surgeon were unable to properly cleanse his hands he had no business to do abdominal surgery. It was wise, however, in hospital practice to insist that the internes assisting at the operation should wear rubber gloves, for the reason that they were compelled to dress a great variety of septic cases.

Dr. Joseph E. Janvrin, of New York, said, regarding the use of hot saline solution after operation, that thirty years ago, when he had been assisting Dr. Peaslee, it had been the custom of the latter to insert a glass tube and wash out the

abdominal cavity with saline solution. He felt positive that this important practice had originated with Dr. Peaslee, and thought due credit should be done in this matter to such a great American surgeon.

DR. A. PALMER DUDLEY, of New York, said that he dif- fered materially from those who claimed that gauze did not act as a drainage material when properly used. He did not mean to say that gauze should be used as drainage through an abdominal incision, for under such circumstances it would not act as a drain, the rectus muscles interfering with this action of the gauze. If, however, it were used per vaginam it would always secure efficient drainage—a fact which could be easily attested by any one who would carefully observe such cases for the first twenty-four hours after a laparatomy. His own practice was to leave the gauze in for five days, for the reason that the gauze clung to the peritoneum and intestine, and if it were torn away while still attached there was a liability that the intestine would be drawn down into the incision and would become adherent. The gauze had the advantage over the tube in the fact that it did not allow air to enter the abdominal cavity after laparatomy, as did the drainage tube. It also prevented the intestines from becoming adherent to any raw spots in the pelvis. For these reasons the patient got up with less intestinal adhesions, less discomfort, and less reflex troubles.

DR. W. H. WATHEN, of Kentucky, said that he very seldom removed a pus tube or ovary except through Douglas' pouch, either by the use of ligatures or clamps. He had had no fa- talities from such work, and the convalescence had been much more prompt and satisfactory than from operations done by the abdominal route. The only exceptions had been in cases in which too much gauze had been used. When this mistake had been made, instead of securing drainage one produced ac- cumulation. He favored securing perfect drainage by the in- sertion of a soft rubber tube. It was difficult to see how any one who had carefully and persistently followed the vaginal method could feel like returning to the abdominal route. He was entirely opposed to the irrigation of the peritoneal cavity, and believed many patients had died as a result of this prac- tice. It was far better, in his opinion, to remove septic matter by wiping with gauze. He had never torn the bowel in the effort to enucleate pus tubes through the vaginal incision, but he had done so in operating by the abdominal route.

DR. A. LAPTHORN SMITH, of Montreal, said that he agreed with those who had seen no harm and much good from the moderate use of opium in these operative cases. He was posi- tive that he had saved three or four lives by the use of salt solution. It was especially valuable where large tumors were removed, thus causing sudden relaxation of the abdominal veins. He was a strong advocate of the method of vaginal drainage by a rubber tube passing from Douglas' cul-de-sac into the vagina. The method could be easily applied if the vagina had been properly prepared.

Dr. J. Wesley Bovée, of Washington, D. C., said that there was no question in his mind regarding the value of using salt solution in these cases. Prior to operation these patients were very thoroughly drained by thorough purgation and a light diet, so that the tissues had been deprived very largely of their customary supply of fluid and absorbed the saline solution with avidity. It had been repeatedly demonstrated that it was impossible to make the hands aseptic and keep them so for any length of time during an operation, and hence it seemed imperative that the surgeon should make use of rubber gloves. The gloves should be of rubber, as this was the only reliable and impermeable material. In operating upon pus cases it was a very wise precaution to wear such gloves, and thus more thoroughly protect the subsequent cases from infection.

Dr. J. Riddle Goffe, of New York, said that he did not hesitate to give morphia hypodermatically on the first night or two after operation, but in general even this could be avoided by allowing the patient, as soon as out of the anesthetic, to assume a comfortable position either on the back or side.

Dr. Robb closed the discussion. He said that the use of salt solution in the abdominal cavity had, in his experience, materially reduced the thirst complained of after operation. He objected to the use of a glass tube for drainage on the ground that it did not drain any better than gauze, and contained just as many bacteria, besides inflicting more trauma on the tissues than did the gauze. It was not unusual for the tube to become filled up in a short time with clotted blood. As a rule he did not use gauze at all for drainage, as he was of the opinion that drainage was not necessary in most pus cases. In many of his cases of pyosalpinx large collections of pus had escaped into the peritoneal cavity, but he had simply washed out the pus and the patients had recovered without trouble. This pus was perfectly harmless and could be injected into animals or into human beings without doing any harm. The rule mentioned by some of the speakers, that rubber gloves should only be used in septic cases, could not be applied in practice, because in many instances the surgeon might operate without gloves on a cervix, for example, under the impression that it was not septic, and yet microscopical examination would show the presence of the streptococcus. The routine use of morphia after these operations did not seem to him necessary, but he did not hesitate to employ it when indicated. He had made use of the sea sponges for a long time, but had found gauze sponges equally efficacious if made properly. Their use, perhaps, made the operation a little longer, but no one could be absolutely sure that sea sponges were sterile. If the operator employed rubber gloves the only part which could not be absolutely sterilized was the skin of the patient. After a little practice with the rubber gloves it was possible to operate almost as rapidly as with the uncovered hands.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Urinary Toxicity during Pregnancy.—Labadie-Lagrave, Noé and Basset[15] have conducted a number of experiments upon pregnant guinea-pigs, which show that during normal pregnancy or ectopic gestation the urinary toxicity is diminished by half. They hold that this variation of toxicity may be considered a new sign of pregnancy, reinforcing other probable signs.

Physiology of Pregnancy.—Bossi[15] shows that during pregnancy certain phenomena, similar to those of menstruation, may be observed at the periods at which menstruation would occur in the non-pregnant state. He speaks of these as "periodical menstrual crises of pregnancy."

Incoercible Vomiting of Pregnancy.—Audebert[15] reports two cases of uncontrollable vomiting of pregnancy which were cured immediately by the replacement of the retroverted gravid uterus.

Law of Adaptation.—Fournier[15] states that the placenta is usually inserted for its entire length along one side of the uterus, at the end of the antero posterior diameter of the uterus and the right oblique of the pelvis. This determines the usual position of the fetus, one side of which is in contact with the placenta.

Pregnancy with Hydrorrhea.—J. E. Dubé[20] describes a case of hydrorrhea beginning at the fifth month of pregnancy and lasting sixty days, during which time from two to six ounces of amniotic fluid were lost daily. Premature labor occurred at the seventh month, the child dying soon after birth.

Mineral Elements in the Fetus.—L. Hugounenq[21] has determined that the loss of mineral matter from the maternal organism by transfer to the fetus occurs chiefly during the last three months of pregnancy, at least two-thirds of its mineral salts, including those of iron, being fixed during that period. For this reason he considers it advisable not to administer chemical compounds of this character, but to increase the supply of food rich in iron, phosphorus, and lime at this time.

Expression of the Placenta.—*Chavanne*[15] reports a number of successes with Budin's method of expressing the previously detached placenta in cases of abortion by approximating a hand upon the abdomen to two fingers placed in the posterior cul-de-sac. He considers it necessary to administer chloroform until complete muscular relaxation occurs. *Demelin* states that this method is especially indicated in cases of prolonged retention of the placenta in the cervical canal when it is thus beyond the zone in which contractions of the fundus can act effectively. *Charles* does not believe the use of chloroform necessary. *Budin* thinks it useful, though not indispensable.

He says that the maneuvre should always be preceded by complete separation of the placenta and replacement of a retro-deviated uterus.

Monstrosity.—Caracache [15] describes an unusual combination of malformations, an anencephalic monster without a spinal fissure and with a bifid face.

Placentitis.—X. Delore [12] holds that placentitis is of bacterial origin, the germs penetrating by means of the blood or through the uterine canal by an ascending infection. Two forms of the lesion exist, the villi being involved in one, the decidua in the other. Thrombosis of the placenta is caused by bacteria which either traverse the organ, become attached to its surface or in the walls of the villi, or disappear leaving the lesions of placentitis.

Retention of Urine.—A. Herrgott [12] describes a case of retention of urine of unusual etiology. The uterus at three months of pregnancy compressed the rectum, and the large accumulation of fecal masses subsequently forced the uterus forward against the bladder, preventing the latter from discharging its contents. Catheterization removed 4,450 cubic centimetres of urine, or nearly four and a half litres. The bladder had previously extended to a point six finger breadths above the umbilicus. Three enemata were administered after catheterization, and the writer claims that the fecal matter discharged filled eight chambers.

X-ray in Obstetrics.—H. Varnier [12] has found, by experiments upon a number of pregnant living women and cadavers, that X-ray photographs can be made to show the head of the fetus at the pelvic inlet at any time after six and a half months. Such a photograph allows determination of the size, position, degree of flexion, and engagement of the fetal head. In each case the length of exposure must depend upon the individual tube employed. A short exposure shows only the maternal pelvis, while one of longer duration brings out the outlines of the fetal skull. In photographs so obtained in the position of dorsal decubitus, with the plate beneath the patient, neither the vertebral column nor the extremities of the fetus are visible.

Cardiac Disease in Pregnancy and Labor.—W. R. Wilson [47] advises for the general treatment of acute pericarditis rest, ice applications over the precordia, and measures to combat the primary condition underlying the pericarditis. Digitalis is especially contraindicated, as the heart, hampered in its action by the pericarditis, has already reached the limit of its energy in overcoming the increased resistance to the circulation in gestation. Paracentesis, if indicated, is to be practised without considering the condition of pregnancy. The obstetric treatment should be directed to the postponement of labor as long as possible, avoiding the inevitable overstrain of the heart during labor. Where labor occurs speedy delivery should be accomplished. Ether narcosis may be used. In chronic adhesive pericarditis the relief of strain both during pregnancy and labor is indicated.

For functional derangements he gives tonics, diversion, regular walks in the fresh air, massage, and, where nausea exists, a diet arranged so that the gravida is never without food for a longer period than two hours. For acute endocarditis accompanying pregnancy there are no especial indications for treatment other than complete rest.

In chronic diseases where compensation is present there exist no indications against marriage. The conditions in advanced cardiac disease would likely prohibit the idea of marriage in the mind of the patient herself.

Considering heart disease in its early development, as it occurs in pregnancy, the first axiom of treatment is the avoidance of drugs where the heart's action remains regular. In the later stages cardiac stimulants, to equalize the circulation and overcome pulmonary stasis, are necessary. The use of digitalis. or strophanthus and nitroglycerin, together with laxatives and the employment of strychnine, is essential in this connection. The administration of potassium iodide or veratrum viride in simple hypertrophy with overaction may be indicated.

Milk taken with the meals and between them is of great benefit. The patient should lie down one hour a day in cases where the cardiac disturbance is slight; in advanced cases the patient should be confined to bed for at least the earlier half of the day. Lactation is contraindicated, as is the Nauheim method of cardiac exercise.

In the stage of asystole the energetic use of heart stimulants, together with venesection, is indicated, although interference from an obstetric point of view in these cases often becomes imperative. Such interference is also indicated in those cases where the circulatory disturbance is not great enough to point to a fatal outcome, and yet where serious aggravation of the heart symptoms may arise from the presence of uncontrollable vomiting.

As to the obstetric treatment, abortion is not to be advised, and the induction of premature labor should be reserved for those cases in which further progress means the death of the patient. When sudden death threatens the patient celiohysterotomy is to be performed. Ether is the best anesthetic to use. The indications are against the use of ergot.

Cervical Incisions in First Labors.—*Fochier,*[15] having noticed that in many cases an abnormal thickening of the cervix delays dilatation in primiparæ, has tried making incisions in the cervical tissue as soon as the cervix will admit the finger. In the 24 cases in which this was done the period of dilatation was diminished. The writer believes that by so doing it lessens the chances of fetal mortality. *Charles* fears that this method may be abused and that the incisions may be the starting point for lacerations. *Delore* considers it indicated only when labor is extremely slow. *Guéniot* thinks it should be reserved for cases of anatomical rigidity of the cervix. *Doléris* holds that to be effective the incisions should involve not only

the free border of the cervix, but also the muscular zone above. He prefers dividing this muscular tissue above and rarely interfering with the lower portion of the cervix.

Puerperal Septicemia.—*Macé* [15] has been led to try the treatment of puerperal septicemia by cold baths on account of the successful result obtained by this method in a very severe case. He believes that it is contraindicated by peritonitis, phlegmasia alba dolens, cardiac asthenia, and myocarditis. He employs baths every two or three hours at a temperature not below 77° F. *Fochier,* [16] on the contrary, uses this treatment only when the heart becomes weak and the urine is diminished, and he does not allow the temperature of the bath to be less than 72° F. *Charles* also states that the chief use of the cold bath is to stimulate the heart, nervous system, and the organism as a whole. He calls attention to the fact that antistreptococcic serum may be inefficient, as several varieties of the germ exist. Denys has differentiated sixteen of these, and gives a dose of one hundred cubic centimetres of their mixed serums. Hubert has obtained four cures of severe cases by this method.

Rupture of Vagina during Labor.—Horn [1] reports a case of rupture of the vagina during labor in a IVpara, 33 years old, who had a flat, rachitic pelvis. Before being admitted to the hospital two attempts to deliver with forceps were made and ergot had been administered, the patient was in a state of collapse with small, thready pulse and anxious facial expression.

There was a continuous oozing of dark blood from the genitals. Uterus contracted. Parts of the fetus apparently escaped into the abdominal cavity. Diagnosis, rupture of some part of the genital canal. Head firmly wedged into the inlet. Perforation and extraction, the latter followed by the expulsion of large masses of coagulated blood. Upon introducing the hand into the vagina the hand entered the abdominal cavity, and it was found that the uterus was almost entirely separated from the vagina, the tear extending into the right parametrium. The condition of the woman was so deplorable that laparatomy was considered injudicious. The vaginal tear was closed by a few sutures, and the remaining gap, as well as the uterus, were tamponed with iodoform gauze. Much to Horn's surprise, the patient recovered and left the hospital four weeks post partum.

Rupture of the Uterus.—A IIpara, 34 years old, with flat, rachitic pelvis, was admitted to the hospital with a rupture of the uterus. Solowij [2] extirpated the uterus per vaginam; the patient died the following day. Postmortem showed peritonitis and an extensive laceration of the peritoneum, the latter probably being responsible for the fatal termination. This case is an excellent example of the fact that in rupture of the uterus the organ should never be removed per vaginam, but always after opening of the abdomen, so that all injuries are under ocular inspection.

Pregnancy complicated by Cancer of the Cervix.—Jahr-eiss[?] reports four cases of cancer of the cervix during preg-nancy. In one he induced abortion, in two Cesarean sec-tion was performed, and the fourth aborted spontaneously. One case of Cesarean section perished from septic peritonitis, the others recovered for the time.

Inversion of the Uterus.—Braun-Fernwald[6] reports a case of inversion of the uterus in a IIpara, 24 years old, who gave birth to twins, and in whom both placentæ were expelled spon-taneously one-half hour post partum. A few minutes later there occurred a severe hemorrhage and a bleeding mass ap-peared outside the vulva which was recognized as the inverted uterus. This was easily replaced by making pressure with the clenched fist. The puerperium proceeded without unfavorable symptoms. The author ascribes the accident to the twin labor and the weakly condition of the patient. Traction upon the cord could be excluded.

Triplets.—G. W. Thompson[34] reports an interesting case in teratology. Two of the children were females, the other being a male. The females were both in one amniotic sac and were attached by a single cord and one placenta. They presented a well-defined case of thoraco-gastrodidymus. The male child was separate from the monstrosity in all respects, having its own amniotic sac, cord, and placenta. The children all died immediately after birth. The mother made a good recovery.

Ectopic Pregnancy.—Rudolph Matas[41] reports a case of ectopic gestation which lasted nearly up to the third month, when it ruptured into the left broad ligament, forming an intraligamentous hematocele. This hematocele continued to increase until it also ruptured into the general peritoneal cavity, where the hemorrhage became partially encysted, forming a large intraperitoneal hematocele. Coincidently or prior to the ectopic gestation an intraligamentous cyst formed in the opposite broad ligament. Laparatomy was performed and the blood evacuated and the vessels ligated. After the laparatomy a peritonitis set in, followed by septic infarc tions of the liver. Free hepatotomy after resection of the ribs was followed by a complete recovery.

C. H. Whiteford[42] cites a case of ruptured ectopic gestation on which he operated. The rupture was followed by infection. Before closing the celiotomy wound five and a half pints of hot saline solution were poured into the abdomen; this par-tially revived the patient, who was in a precarious condition. Eight and a half pints of saline solution with one ounce of brandy were injected into the axillary vein. Patient recov-ered.

A. Pinard and P. Ségond[12] record a case of extrauterine pregnancy diagnosed at the sixth month. By careful hygienic measures the pregnancy was carried nearly to term. The sac was then opened and its edges sutured to those of an abdom-inal incision after removal of the child. The placenta was expelled in fragments, the last portion coming away in ten

weeks. The child's face presented an asymmetrical condition due to an improper attitude, but this disappeared, and mother and child are in good health. Pinard had previously reported a similar case in which he saved both mother and child.

L. Desguin [14] describes the pathological conditions found during a laparatomy performed ten months after a tubal abortion which had not been operated upon. A few adhesions existed around the ovary; the uterus was notably enlarged and firm, but movable. The ovaries were cystic, and the tube which had been the seat of the ectopic gestation contained simply an organized clot, the size of a bean, in its inner third. He cites this case as confirming his belief that many extra-uterine pregnancies which have aborted pass unnoticed.

E. Bromet [43] describes a case of extrauterine gestation which closely resembled a uterine pregnancy. This pregnancy went on until the eighth month, when a spurious labor set in which lasted a few days and then subsided. Four months after this spurious labor he opened the abdomen and removed a partially decomposed female child weighing nine pounds. The placenta came away easily with very little bleeding. The patient recovered.

O. B. Will [44] also reports a case of ectopic gestation which went on to term. The abdomen was opened, but the surgeon, supposing he had a malignant growth to deal with, closed the abdomen. Five months later the abdomen was opened in the former line of incision and a fetid discharge began. Two months later the abdomen was opened and a putrid mass of decayed fetus, placenta. pus, feces, and urine was removed. The cranial plates had separated, and one of them had cut off the ileum at its junction with the colon to the extent of about two-thirds of its circumference. One bone had perforated the bladder. The cavity was cleaned for several successive days and finally began to contract. Five separate attempts were made to suture the separated gut, each time a small portion growing together until the last time, when the wound closed. The patient went on to recovery.

Lewis S. McMurtry [45] speaks of a case on which he operated at the second month and obtained a good recovery.

Symphyseotomy.—W. G. Swayne [46] performed this operation, with good results, on a young woman at term. Her conjugate was estimated to be $2\frac{3}{4}$ inches, and, as the bones at the symphysis separated about two and a half inches, he gained about one inch in the conjugate. The patient was allowed out of bed on the twentieth day after the operation and did not suffer any interference of locomotion. The child was born alive.

Draghiesco [13] reports a second symphyseotomy upon the same patient, both being successful. After the second operation locomotion was somewhat more difficult, and the ability to walk was acquired more slowly than after the first.

The Value of Posture in the Treatment of Occipito-posterior Positions.—C. M. Green [37] rarely advises a patient

in the last days of pregnancy to assume a particular posture in the daytime, with a view to converting posterior to anterior positions, but he often advises sleeping in the latero-prone position on the side toward which the occiput is directed. In multiparous labors where the head is high he places the woman in the kneeling, forward-bending posture early in the first stage, varied with the appropriate latero prone position, until the head is engaged anteriorly. In primiparæ, if there is no relative disproportion, he employs no especial posture until the second stage, when he keeps the patient in the appropriate latero-prone posture until anterior rotation occurs.

Forceps Deliveries.—Dubrisay and Thoyer [16] report 236 cases of forceps deliveries at the Tarnier Clinic from November 1, 1894, to March 31, 1899; 206 children were living, 30 dead. The maternal deaths numbered 2. All applications at the superior strait were in the oblique position.

Operations for Contracted Pelvis.—*P. Bar* [15] has performed 10 Cesarean sections and 21 symphyseotomies, with one death from the former operation. He considers Cesarean section a conservative operation when performed before the onset of labor and preceded by an injection of ergotin to prevent atony. Bar has performed this operation successfully upon the same women on two occasions. He mentions the disadvantages of symphyseotomy, danger of infection, urinary difficulties, prolapse of the uterus, and wounds of the bladder. He urges the advantages of Cesarean section when labor has not begun, when aseptic conditions can be obtained, and especially when the woman is a primipara with a narrow pelvis. *Charles* [15] looks upon Cesarean section as simple, easy, and perhaps less dangerous than symphyseotomy. *Bossi* prefers premature labor or Cesarean section to the latter operation as being more easy of execution at the patient's home. *Fochier* holds that symphyseotomy is more serious than Cesarean section, on account of operative shock from opening articulations. He believes the mother's life more valuable than that of the child, and if the mother objects to the operation he favors embryotomy.

Cesarean Section.—J. W. Williams [37] reports a successful Cesarean section which he performed on account of a cystic tumor in the pelvis. Both the mother and child made good recoveries.

A. McDairmid [39] reports two Cesarean sections. One case he operated on, the other being performed by J. S. Gray. McDairmid's Cesarean section was performed on account of the excessive shortening of the conjugate diameter by an enormous sacral promontory. The child, a ten-pound male, was born alive. The mother also survived the operation. McDairmid states that his is the first successful Cesarean section west of Lake Superior in Canada. J. G. Gray's section was performed for the same deformity and with the same results.

Schick [2] performed Cesarean section in a woman 28 years old who was in a dying condition, and was able to secure a

living child. The absolutely hopeless condition of the mother, who suffered from tubercular meningitis, justified this operation, especially as the fetal heart sounds were perfectly clear and normal in ratio and intensity. Statistics show that postmortem Cesarean sections save but a small percentage (5 per cent) of the children, and, in the author's opinion, the operation, if possible, should be performed before the death of the mother, especially if the dissolution is only a question of minutes.

Pollak[4] reports a case of a woman 24 years old, with a flat, rachitic pelvis, on whom Chrobak performed three consecutive Cesarean sections with the result of a living mother and three living children. Pollak describes the condition of the uterine scar and states that the excellent results obtained were due to the deep sutures of braided silk.

Rossa,[8] of Graz, reports 2 cases of Cesarean section in which the uterus was opened through the transverse incision recommended by Fritsch. With this incision there is less loss of blood. It is not necessary to compress the lower uterine segment, and there is decreased danger from atonic hemorrhage.

A. Herrgott[12] was obliged to perform Cesarean section upon a case in which, after rupture of the membranes, an immovable tumor in the pouch of Douglas was found to prevent delivery. The child was saved and the uterus sutured with catgut, but the patient's condition prevented removal of the tumor, which was a dermoid cyst in the right broad ligament. A purulent discharge from the uterus and from the abdominal wound followed, and the uterine cavity was found to communicate with the external air through the wound in the abdomen. The discharge ceased after the extrusion of the catgut suture, which had been the source of infection.

GYNECOLOGY AND ABDOMINAL SURGERY.

The Menstrual Function and Hematopoiesis.—Giuseppe Poggi[10] says that the fact that menstruation may influence the hematopoietic function is not unknown, although there have not been many exhaustive researches into the subject. Isolated observations, however, made upon the blood during the menses, show that there is an intimate relationship between the two processes. In order to ascertain the modifications which may occur in the blood during menstruation, Poggi instituted a series of experiments upon normal patients, determining the amount of hemoglobin daily with Fleischl's hemameter, during and after the menstrual flow, for about a month. The charts show that the curve of hemoglobin is nearly always lowered for a few days before the appearance of the flow, just at the time when disturbances of various kinds are apt to occur. When the flow is established the hemoglobin usually reaches the first level. The author is unable to state whether the diminution of hemoglobin during the menstrual period is in proportion to the quality or to the intensity of the pain

suffered by the patient, but he does state that it bears no rela-
tion to the amount of blood lost. The anemia, appearing, as it
does, before the flow, cannot be attributed to loss of blood, but
must be due to more complicated and recondite causes. The
transitory oligo-chromemia does not continue after the flow;
moreover, the 200 cubic centimetres (about) of blood lost
gradually throughout several days could scarcely account for
a lowering of hemoglobin to $10°$ to $15°$ which frequently occurs,
and besides it is very quickly replaced by means of the func-
tional activity of the hematopoietic organs. In such small
hemorrhages the number of new cells produced may be two or
three times greater than that lost. This may be the reason
why the curve of hemoglobin, which was lowered during the
premenstrual period, rises as soon as the flow is established.
The author asks himself whether the diminution of hemoglo-
bin is real or apparent. Pallor of the face and extremities, so
often present during menstruation, is not a certain symptom of
anemia, since it may be produced by simple constriction of the
cutaneous capillaries from vasomotor disturbances. The ute-
rus and ovaries, during menstruation especially, become the
seat of centripetal stimulation, and it is a well-known clinical
fact that stimulation of the genital tract may cause the great-
est variations in the calibre of the blood vessels. By experi-
mentation Poggi found that the diminution in the hemoglobin,
however, is real, and not dependent upon constriction of the
peripheric veins or a displacement of the blood mass.

The lowering of the hemoglobin curve is in relation to the
lessened consumption of albumin which occurs in menstruating
patients, and is manifested by diminished elimination of nitro-
gen through the urine and feces, this diminution taking place
a little before the appearance of the uterine hemorrhage, at the
same time as the descent in the hemoglobin curve. The pro-
cesses of nutritive exchange are therefore retarded during
menstruation. This function causes a depression in all the
organic functions, the temperature is lowered, blood pressure
is diminished, the nerves, especially the vasomotor nerves, are
more torpid, respiration is less easily influenced by external
stimuli, the mobility of the stomach is impaired, and muscular
weakness usually occurs. Reasoning by analogy, Poggi be-
lieves that the diminution of the hemoglobin is due to a
retardation in the production of blood. He holds that the ner-
vous system plays an important part in this process, an impulse
being transmitted from the cerebro-spinal centres to the gan-
glionic system of the generative organs, thence to the ovary,
this organ being the medium for the special activity of the
nerves. Still, it cannot be the only factor, since Goodman
found a vaginal menstrual flow in the case of twenty-seven
women whose ovaries had been removed. Many other facts go
to prove that the nervous system has a marked influence upon
menstruation, as, for instance, that intense emotions may sup-
press or increase the flow. It is hard to say by what mechan-
ism a diminution of hemoglobin occurs at each menstrual

period. It might possibly be due to a vasomotor disturbance in the functioning bone marrow such as occurs in osteomalacia, produced, according to Fehling, by a passive congestion of the bony tissue caused by stimulation arising in the ovaries. Under the influence of menstruation something similar to this might occur, the congested condition mentioned causing a stasis in the hematopoietic organs, and hence a clearing of the circulation with consecutive diminution of hemoglobin. The latter would then be seen to depend upon a diminution in the number of red blood corpuscles; but Poggi has not been able to ascertain definitely whether this is the case, on account of the uncertain action of the instruments at our disposal.

Influence of Menstruation upon the Amount of Hemoglobin and the Corpuscles in the Blood.—P. Sfameni[10] pursued investigations on 6 normal individuals, in 4 during one menstrual period only, and in 2 for four months. In each case he first ascertained the differences existing between the results of examinations made during the intermenstrual period and those made during the flow; he then divided the intermenstrual period into three, the first including the three days previous to the appearance of the menses, the second the three days following, and the third the remaining days. He obtained the following results:

	Hemoglobin.	Red blood corpuscles.	Leucocytes.
Average of results of examinations made during the menstrual period	86.50	5,101,109	6,975
Average of results of examinations made before and after the menstrual period	90.58	5,223,552	6,672
Difference in menstrual period.....	—4.08	—122,443	+ 303
Average of results of examinations made in the three days preceding the menses........	90.57	5,321,652	7,040
Difference in menstrual period.....	—4.07	—220,543	—65
Average of results obtained in the three days following the period...	90.09	5,220,749	6,507
Difference in menstrual period	—3.59	—119,640	+ 468
Average of results of examinations made during days remote from period	91.00	5,188,542	6.682
Difference in menstrual period.. ...	—4.50	—87,633	+ 293

These results show that the amount of hemoglobin contained in the blood is constantly diminished during the menstrual period, although to slight extent, being on an average about 4.5 per cent.

The amount of diminution is in direct relation to the amount of blood lost during menstruation. The red corpuscles are fewer in number during menstruation than in the intermenstrual period. The leucocytes are increased in number during the flow.

The Relation between Menstruation and Neoplasms of the Uterus and Appendages.—L. Paoletti [10] says that the etiology of new growths in the uterus and the appendages has not as yet been fully determined. Many causes may predispose to and even cause these lesions, as metritis, cervicitis, endometritis, hyperinvolution, nutritional disturbances (anemia, lymphatism, tuberculosis, etc.).

Menstruation is a function which causes modifications not only in the nervous system but in the blood crasis. Paoletti endeavored to ascertain whether there were any relation, either direct or indirect, between menstruation and neoplasms of the uterus and the appendages. The following table will show the results obtained :

Patients first menstruating at the age of:	Number.	Neoplasms.	Percentage.
8	1	0	Inappreciable.
9	3	1	"
10	22	1	"
11	122	13	10.7
12	336	34	10.1
13	534	46	86.1
14	611	37	60.5
15	491	37	75.3
16	338	25	73.9
17	200	31	15.5
18	127	26	20.4
19	38	4	10.5
20	20	4	20.0
21	1	..	Inappreciable.
22	1	..	"
23	1	..	"
		259	90.8

From these statistics the relationship existing between menstrual anomalies and neoplasms of uterus and appendages is very evident. In women first menstruating between the ages of 14 and 16 we find the smallest number of neoplasms. The greatest number occur in cases of tardy menstruation. Paoletti reaches the following conclusions :

1. Neoplasms of the uterus and appendages are to a great extent caused by nutritive changes in the uterus itself, the result of local lesions, or of reflex lesions from dystrophy of the entire organism.

2. There is frequently an intimate relationship between menstruation and neoplasms of the uterus and appendages.

3. The smallest number of neoplasms is found in women in whom the menstrual function is normally established.

4. In women menstruating precociously or tardily we find the greatest number of new growths, especially in the latter class.

Pains of Menstrual Origin.—This subject is discussed by P. Dalché,[16] who first considers the causes of such pains. In regard to treatment he says that when chlorosis, gout, nervous affections, dyspepsia, or malaria exist such a constitutional cause of the disturbance demands treatment. If there is constipation, laxatives should be administered, never drastic purgatives. If dysmenorrhea is of the congestive type, absolute rest in bed is necessary and hot applications valuable. The pain may be relieved by the use of belladonna ointment upon the abdomen, enemata containing laudanum, belladonna suppositories, or narcotic sitz baths during which a continuous vaginal douche is employed. For ovarian hyperemia ergotin may be used, or hydrastis canadensis, viburnum prunifolium, cannabis indica, or senecio vulgaris, prescribed two days before the expected period and continued while the pain lasts. If dysmenorrhea occurs in women with scanty menstruation, very hot sitz baths, hot vaginal injections, mustard foot baths, mustard plasters on the thighs, etc., are advisable. Emmenagogues should be used with great care. Apiol, diffusible cardiac stimulants, Swedish massage, bicycling and riding. For pain due to the tubes vaginal suppositories of ichthyol are advised. For painful, retarded menstruation ovarian opotherapy has given good results. For neuralgia the writer advises belladonna ointment, menthol, or cannabis indica. If pain is severe and not controlled by other remedies, hypodermatic injections of morphine must be given.

Treatment of Retroversion of the Uterus.—Mouchet[17] records two cases of pregnancy with irreducible retroversion of the uterus, which was imprisoned in the pelvic cavity. Both were treated by laparatomy, at the third and fourth months respectively, and the uterus fixed to the anterior abdominal wall. Labor occurred at term.

Jacobs[14] considers abdominal hysteropexy one of the worst interventions of modern gynecology and very rarely indicated. He strongly favors vaginal hysteropexy, which he has never seen followed by accidents in subsequent pregnancies. He claims excellent results from intra-abdominal shortening of the round ligament, which he performs by doubling the ligament upon itself and passing the suture so as to include the subjacent broad ligament. In one case he has been obliged to remove the appendages of one side on account of the formation of a hematoma within the ligament; and in another, necrosis of a portion of the round ligaments was supposed to have followed the operation.

Operative Treatment of Retrouterine Displacement.—Rumpf[7] disapproves of the operation of vaginofixation, which he says has caused much misery and is happily discarded by most of its formerly enthusiastic adherents. He advocates a modification of Alexander's operation. To avoid inguinal hernia the round ligaments are more carefully attached and the inguinal canal is obliterated as in Bassini's operation.

Elephantiasis of the Vulva.—Lauwers[22] reports an operation for a case of elephantiasis of the vulva of twenty-four years' duration, the tumor reaching two hand breadths below the knee and the portion of the growth removed weighing over thirteen kilogrammes.

Intrauterine Vaporization.—Abram Brothers[23] states that the use of steam at a temperature of the boiling point or above was suggested by Sneguireff, of Moscow, about five years ago. At the present time it is being extensively tried in Russia and Germany. The apparatus consists of a brass kettle provided with a safety valve, a central opening for the insertion of a thermometer, and a short elbowed spout, to which is attached the rubber tubing for the passage of steam. The metal catheter is attached to this tubing. The steam is generated in the brass kettle by means of heat derived from alcohol lamps.

The patient is placed in the lithotomy position and the genitals cleaned and the cervix dilated. The uterine catheter attached to the tubing is introduced to within a short distance of the fundus of the uterus. The steam is turned on for from five to thirty seconds, as the necessities of the case indicate. On removing the catheter a strip of iodoform gauze is introduced past the internal os even up to the fundus. During the application of the steam the nurse may play a stream of cold water against the cervix. In order to prevent scorching of the cervical canal and burning of the operator's hands, it is well to encircle the instrument in gauze up to a point about one inch from the top. The after-treatment consists in keeping the patient in bed for several days and applying an ice bag to the hypogastrium. For a few days there is a free leucorrheal discharge, in some cases tinged with blood. Perimetric irritation or inflammation may follow the procedure. Stricture of the cervix, complete obliteration of the uterine cavity, and an artificial menopause have been brought about unintentionally by uterine vaporization.

As a hemostatic it has been employed successfully in cases of non-malignant post-climacteric uterine hemorrhages. It has proved curative in the various irregular bleedings met with in connection with catarrhal, fungoid, or hemorrhagic endometritis. It acts as a palliative measure in certain cases of fibroid tumors or inoperable carcinoma associated with hemorrhage. As a caustic it can be relied upon to destroy the mucous lining of the uterus, even to the obliteration of the cavity. As a bactericide it may be used in cases of gonorrheal and septic metritis; Fouomenow has found it effective. Vaporization has been successful in reducing subinvoluted uteri. Fouomenow has reported successful results in cases of abdominal fistulæ of several years' duration which had resisted all other treatment.

Gangrenous Metritis and Vaginitis.—Porak[24] records a case of gangrenous metritis and vaginitis following labor and resulting in complete disappearance of the uterus and absolute closure of the vagina by adhesion of its opposite walls. The vagina

was restored by breaking down the adhesions and applying skin grafts of large size removed from the thigh, and sexual intercourse has been performed without difficulty since cicatrization has been complete.

Absence of Vagina.—A. Boursier [25] describes a case of congenital absence of the vagina with rudimentary uterus and tubes and nearly normal ovaries   The menstrual periods were marked by severe attacks of pain in the ovarian regions.   An artificial vagina was constructed and lined in part with a flap from the vulva.   It has been maintained by occasional dilatation with graduated rectal bougies.   Although no menstrual discharge has occurred, the painful menstrual crises have greatly diminished.

Abnormal Vagina.—J. Godart [51] describes a case in which the upper portion of the vagina was nearly closed by a transverse septum, the cervix opening into a cul-de-sac above. After enlarging the small opening in the septum by an incision, the cervix was dilated and a right pyosalpinx was removed by the abdominal route.   Six weeks later the patient's condition was excellent.

Dysmenorrhea in Cases of Narrow Cervix.—In 100 cases of dysmenorrhea and sterility in which a conical cervix existed with a contracted internal os, S. Kolinovsky [26] dilated the cervix partially, made radiating incisions at the os internum to the depth of one-half to two millimetres, dilated more completely, and performed curettage.   If the external os was contracted he dilated that and applied tincture of iodine to prevent union of the lips of the wound.   In all cases dysmenorrhea disappeared, and in 20 cases pregnancy followed.

Gynecological Operations for Mental Disease.—Picqué and Febvre [26] report 22 operations for surgical genital affections in patients suffering from mental disease as resulting 12 times in absolute cure of the latter, 6 times in improvement, with 3 cases unchanged and 1 death.   They deprecate operating upon cases of dementia, general paralysis, hysteria, and those having delusions of persecution.

Uterine Fibroids.—Boursier and Binaud [25] record a case of fibroids in which the uterus had so increased in size as to extend above the umbilicus before giving any subjective symptoms.   The tumor had grown between the layers of the broad ligament, one portion raising the peritoneum of the pouch of Douglas to nearly the level of the umbilicus.   The patient recovered after total abdominal hysterectomy.

Extirpation of the Uterus and Vagina for Cancer.—At a recent meeting of the Berlin Gynecological Society, Mackenrodt [27] demonstrated a specimen of a uterus and vagina which he had extirpated *in toto* for cancer of the vagina.   A woman, 28 years old, who suffered from extensive cancer of the vagina, came to him for aid after many prominent gynecologists had declared operation impossible.   Mackenrodt decided that extirpation with the ferrum candens was practical. and the brilliant success attained is ample proof of his good judgment and exceptional skill.   The patient made a good recovery.

Operations on the Rectum by the Vaginal Method.— Liermann[27] reports 6 cases of resection of the rectum after Rehn, whose method is especially applicable in cancer of the rectum. The operation consists in dividing the posterior vaginal wall, exposing the rectum, which is freed from the adjacent tissues and drawn downward. Next the rectum is divided above the sphincter and the anal mucous membrane removed as in hemorrhoid operations. The rectum is then drawn through the sphincter and sutured to the external wound. In the 6 cases reported the results were excellent, all wounds healing per primam.

Floating Kidney and Appendicitis.— Hadra[28] takes issue against the teachings of Edebohls, who believes that attacks of appendicitis are caused through mobility of the kidney. The author states that the duplicity of these affections is simply a coincidence, mainly due to their comparative frequency. The 12 cures of appendicitis after nephropexy reported by Edebohls are explained by enforced rest in bed and careful after-treatment. According to Hadra, chronic appendicitis is one of the most frequent maladies man is subject to, especially the obscure, slow variety which is termed appendicitis occulta. This form originates through the entrance of feces into the appendix, which organ is normally empty; their presence, causing a continuous irritation, is finally followed by acute symptoms.

Leucorrhea treated with Vaginal Injections of Yeast Plants.— The usual local treatment of fluor albus is only of temporary benefit, therefore Landau[29] proposes to introduce non-pathogenic germs into the vagina, which, through their growth, interfere with the vital conditions necessary for the pathogenic bacteria. Landau experimented with 40 obstinate cases of leucorrhea which he treated with injections of yeast plants (saccharomyces cerevisiæ). repeated every two or three days. The results were surprisingly good, the discharge immediately disappearing, only to return in a few exceptional cases.

Conservative Surgery on the Female Genital Organs. —G. Ben Johnston[50] states that the difficulties encountered are great. 1. It often entails prolonged efforts, thus increasing the liability to shock. 2 Extensive manipulations which denude the peritoneum, thereby increasing the risk of infection and setting up post-operative adhesions and, maybe, intestinal obstruction. By dealing with open pus cavities grave danger of infection occurs. It often requires many wounds, which mean much hemorrhage, numerous cavities to be repaired, foreign suture material left behind to accomplish these repairs, the possible formation of blood clots which furnish foci for infection, a likelihood of secondary hemorrhage, perhaps painful scars, and almost certainly, when many points have been subjected to operation, post-operative adhesions. 3. The bruising of the tissues and thereby impairing their recuperative powers. 4. Finally, the prospect of a second operation.

Chlorosis.—G. Etienne and J. Demange [52] have observed a case of chlorosis of sudden onset which they believe to have been due to the occurrence of an acute ovaritis. They hold that when pregnancy began the formation of new corpora lutea of menstruation was suppressed and that the corpus luteum of pregnancy furnished the internal secretion during that period. Abortion occurred suddenly at the third month and was rapidly followed by symptoms of chlorosis and signs of acute inflammation of the left ovary. They state that a month after the abortion menstruation occurred, and, a new corpus luteum having thus formed, the chlorotic condition rapidly disappeared. The administration of ovarine was begun shortly after the beginning of the chlorosis.

Rupture of the Spleen.—Savor [53] reports a case of extirpation of the spleen for traumatism occurring in the sixth month of pregnancy. The operation was performed sixteen hours after the accident. Pregnancy continued uninterrupted, and the woman gave birth to a living, well-developed child at full term.

The Treatment of Pelvic Peritonitis.—After an exhaustive trial, Stratz [54] has abandoned the operative treatment of pelvic peritonitis and has again become an advocate of conservative therapy. In very acute cases he recommends the application of ichthyol over the abdomen and vaginal irrigation with hot sterilized water. In the chronic forms abdominal massage was followed by excellent results.

A Serious Injury following Attempted Curettement of the Uterus.—Boldt [30] reports a case of perforation of the uterus which again forcibly demonstrates the great risks connected with this operation, commonly termed simple and harmless. A physician attempted to curette the uterus with a view to remove *the remains* of a recent abortion. He stated that he seized a "lump of fat" with a pair of placental forceps, and in making traction brought into view a whitish, glistening structure. After fruitless attempts to remove this with the forceps he made traction with the finger, but it tore asunder, and then for the first time he discovered that it was a coil of intestines and not fetal tissue as supposed. Twenty-four hours later Boldt was called to see the patient, who lived in a neighboring town. He found her perfectly comfortable, free from pain and discomfort, and with a normal pulse and temperature. Even firm pressure failed to elicit abdominal pain. The uterus, the cervix of which had been dilated with a laminaria tent, corresponded in size to the tenth week of gestation. The posterior uterine wall above the internal os was perforated. In the absence of all symptoms laparatomy was deemed inadvisable, but everything was in readiness for an immediate operation. During the next twenty-four hours the patient's condition did not change. She expressed herself as feeling perfectly well and was even anxious to leave her bed. The pulse and temperature also remained unchanged. Telephonic communications on the following day brought favorable reports, but when Boldt saw the patient at 2 P.M. on the third day the aspect of

the case had suddenly changed. The patient was restless, complained of abdominal pains, and within a few minutes the pulse rose from 88 to 140 and soon grew imperceptible. The abdomen was moderately distended and sensitive to pressure. Immediate operation was decided upon, but after opening the abdomen it was discovered that general peritonitis had already set in. The abdominal cavity contained blood and thin feces. The ileum, which was torn from its mesentery for a distance of about fourteen centimetres, was gangrenous, and, except for a small bridge of tissue, completely torn in two. The patient did not recover from the shock. The uterus contained an uninjured ovum.

Boldt terms this case an exceptional one. We fully agree with him that the absence of all symptoms, in spite of serious injury, is exceptional, but perforation of the uterus during curettement is certainly not exceptional, and if all the cases would find their way into print the literature would grow quite voluminous. We may also state that Dr. Boldt communicated to us another case which recently came under his observation and which for various reasons will not be published. Dr. Boldt writes that he opened the abdomen in a case of sepsis following an abortion. The uterus was perforated, but the perforation was seemingly not discovered by the doctor. Dr. Boldt, who saw the patient in consultation, opened the abdomen and found, in addition to other lesions, the perforated uterus.

Acute Mania following Simple Ovariotomy.—J. H. Croom [31] cites a case of this kind and brings out two points especially: 1. The mania developed on the third day after operation. 2. The mania became more violent and the patient died on the sixth day after operation. He believes that this accident after abdominal section occurs very exceptionally in women of sound mind and who have a clean hereditary record. The prognosis as to life in the insanity occurring after operation is always good. He states that besides the case cited above he has no record of an immediately fatal case.

Osteomalacia.—Bossi [16] reports 13 cases of osteomalacia cured by castration, osseous restoration being complete four months afterward. The disease occurred at the period of greatest ovarian activity, 30 to 35. It began in all cases during pregnancy, and was aggravated in all during the days corresponding to the menstrual periods. Histological examination of the ovaries was negative.

Ovarian Secretion.—Keiffer [15] concludes from the study of a number of microphotographs that the corpus luteum alone, and not the ovary as a whole, is engaged in producing an internal secretion.

Malformation of the Uterus.—Blondel [15] describes a case of bicornuate uterus in which the division extended only to the lower segment. The vagina showed traces of a septum destroyed by labor, while the intervening portion, the cervix, was single and no signs of the former existence of a septum at this point could be found.

Gynecological Statistics.—The statistics of operations performed at the Broca Hospital during the past nine years in the service of Pozzi[18] include the following: Abdominal hysterectomies for fibroids, 40 supravaginal, with 7 deaths; 42 total, with 13 deaths; 8 myomotomies, with 1 death. Vaginal hysterectomy has given these results: 38 operations for epithelioma, with 31 recoveries and 7 deaths; 64 operations for fibroids, with 60 cures and 4 deaths; 84 operations for inflammatory but non-suppurative lesions of the appendages and uterus, with 76 recoveries and 8 deaths; 87 operations for suppurative lesions, with 75 recoveries and 12 deaths.

Lymphatic Ganglia and Cancer.—Bezançon and Labbé[19] hold that hypertrophy of lymphatic glands in the vicinity of a cancerous region does not necessarily imply their invasion by the neoplasm, but is sometimes due simply to functional hyperactivity of the glands.

Uterine Fibroids.—In a report of 90 cases of total hysterectomy for uterine fibroids with 1 death, A. Döderlin[22] strongly favors hemostasis by forcipressure. His operations include 33 by the vaginal, 31 by the abdominal, and 26 by the mixed route, the single death occurring in a laparatomy. Hemorrhage was controlled by application of forceps after removal of the uterus. After three days the forceps were removed, and the ureters, which had been included in their grasp, became permeable, but vesico-ureteral fistulæ resulted and subsequently pyelonephritis and death.

The Bacteriology of the Normal Female Urethra.—Schenk and Austerlitz[3] examined the urethras of 60 healthy women and found in 50 per cent no bacteria, while in 30 cases bacteria were present but mostly of non pathogenic character. In 2 cases the bacterium coli was found; the other micro-organisms were saprophytes, probably from the vestibule.

The Bacillus of Cancer.—After extensive investigations extending over a period of four years, Bra.[5] of Paris, believes he has discovered the parasite of cancer. This parasite belongs to the family of ascomyces. Not only was it found in the diseased tissue, but in 22 patients it could be demonstrated in the blood near the diseased area and at the tip of the finger. The culture method and morphology are carefully described and illustrated with seven excellent plates. The microbes can be stained after Gram and grown in bouillon, sterilized milk, agar, and potatoes.

A characteristic of the cultures is that they lose their original color and assume a faint pink. The location of the bacilli varies; they were found upon the surface and within the diseased tissue. Inoculation of pure cultures in rabbits, guinea-pigs, and dogs was followed by characteristic symptoms and the production of tumors having the histological character of cancer. From these tumors again pure cultures could be grown, from which bacilli identical with the original bacillus of the human being were obtained. thus completing the chain of evidence.

Curtis[6] has also devoted years of study to the discovery of the cancer bacillus, but unfortunately did not obtain such brilliant results as reported by Bra. Eighteen careful experiments demonstrated to him that the parasite obtained from human beings could not be transferred to animals, and he concludes that our present means of investigation are not efficient, although he does not doubt the existence of the bacillus.

Cancer of the Uterus.—A case of inoperable cancer of the uterus and vagina, accompanied with pain and a profuse sanious discharge, was treated by T. Ionnesco[13] by ligation *en masse* of the hypogastric, uterine, and utero-ovarian arteries and of the round ligament. The immediate result was a sloughing of the cancerous tissue, leaving an apparently healthy wound, and disappearance of hemorrhage and the sanious discharge.

Three cases of cancer of the body of the uterus are reported by H. Hartmann.[12] They were treated by abdominal hysterectomy and recurrence took place in two, the other being a recent operation. The writer advocates this operation for all such cases and also for operable cases of cancer of the cervix, performing a preliminary curettage in the latter class.

Results of Myomectomy.—Abell[7] publishes 71 cases of myomectomies which were operated on in the Leipzig Clinic during the years 1887 to 1894, and in which he investigated the ultimate results of the operation. In 4 cases the tumor was left behind, but the ovaries were extirpated; of these, 3 women died—2 of malignant degeneration of the tumor, the third from hemorrhages accompanying expulsion of a submucous fibroid.

Contrary to Martin, Abell states that in none of Zweifel's cases did the stump cause discomfort, nor did it undergo malignant degeneration except when the tumor was a sarcoma and not a fibroid.

The ovaries, which are not removed by Zweifel, gradually atrophy, and the advent of the climacterium is less sudden and causes less discomfort. Abell again emphasizes the old doctrine of Schröder that a portion of the uterus should be left behind, and only so much of this organ be removed as is absolutely necessary.

Histogenesis of Dermoid Cysts of the Ovary.—A series of investigations in Pfannenstiel's clinic, as published by Krömer,[7] confirms the theory of Pfannenstiel and Wilmer that these growths develop from the ovule, while the simple ovarian cysts often found in conjunction with these tumors arise from the Graafian follicles. As proof of this ovulogenic origin of dermoid cysts, it is stated that these tumors always contain the three primitive embryonic layers. In one interesting case, which the author describes in detail, the mass was enclosed by a rudimentary uterus probably formed by one of Müller's ducts.

Tumors of the Chorion.—Schlagenhaufer[8] publishes 2 cases of tumors originating from the chorionic epithelium.

The author's careful investigations substantiate Marchand's theory that, clinically, these growths must be divided into two distinct classes, one benign. the other malignant and prone to metastases. Careful microscopical examinations, however, fail to show any difference in the structure of these growths, although their clinical behavior decidedly differs.

Disease of the Pelvic Organs and Appendicitis.—Dührssen,[9] in 30 abdominal sections for disease of the uterus and ovaries, found in 10 cases a diseased appendix, and believes that in about thirty per cent of gynecological affections the appendix will be in an abnormal condition.

Acute Diffuse Gonococcus Peritonitis.—Harvey W. Cushing[32] states that the gonococcus is capable of causing a specific infectious disease, namely, gonorrhea, and at the same time other and less specific pathological conditions. There is experimental proof that in certain small animals the gonococcus can set up acute alterations in the peritoneum homologous with the acute septic serositides in man, but differing from these in their tendency to rapid and spontaneous healing.

Hitherto there has been wanting conclusive proof that in the peritonitides attendant upon gonorrhea occurring in women the gonococcus was solely or chiefly concerned. The inflammations had been variously regarded as mixed infections and chemical inflammations.

The cases reported in this paper bring for the first time convincing evidence of the existence of a diffuse, general inflammation of the abdominal cavity caused by the gonococcus.

It has been recognized that extension of the gonorrheal infection from the genital organs to the peritoneum may occur in the puerperal state; a similar sequel is shown to be possible during menstruation.

Such ascending forms of gonorrhea doubtless under ordinary circumstances remain localized in the pelvis and rarely demand surgical investigation in the acute stage.

A general involvement of the peritoneum such as occurred in the two cases given must either be rare or unrecognized, and may depend upon some especially receptive condition of the serosa or virulence of the organism.

The peritoneum is not more immune than are the peri- or endocardium to gonococcal infection, and, being more exposed, suffers more commonly in females, although the relatively benign course of the disease makes it a rare condition to come to the attention of the surgeon in the acute stages.

Treatment of Gonorrhea in Women.—J. D. Thomas[35] advises bicarbonate of soda, in doses of one-half to one drachm every four hours, to render the urine alkaline. Instead of soda, acetate of potash may be used. In addition to the above, extract of hyoscyamus may be given in two-grain doses every three hours. After the ardor urinæ has passed off, salol in five-grain doses may be prescribed every four hours. To prevent solutions from entering the bladder when being injected into the urethra, pressure should be made with the finger at

the internal meatus. Instead of injections, applications may be made by means of cotton wrapped on a probe. The cotton may be moistened with a solution of carbolic one per cent, nitrate of silver five per cent, or with any solution indicated. In exceptional cases where the vulva is principally involved, such as we find in children and older virgins, it is necessary to put them to bed. The vagina and cervix are best treated by means of irrigation. For this purpose one may use $\frac{1}{3000}$ permanganate of potassium or bichloride of mercury $\frac{1}{4000}$. A local application of nitrate of silver, twenty to fifty grains to the ounce, is made twice a week. If the vulvo-vaginal glands are involved it is better to destroy them.

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DISEASES OF CHILDREN.

Abortive Treatment of Gonorrheal Ophthalmia.—H. D. Jamison' favors the abortive treatment of this disease by a cantholysis and the thorough application of a solution of nitrate of silver, forty grains to the ounce. In the initial stage a positive diagnosis is made with difficulty, except by staining and examining the discharge under the microscope. Many physicians have not the necessary paraphernalia for making this examination, and are so situated that they cannot have it done by a pathologist. Under such circumstances two problems confront us: Shall we wait a few hours until we get all the characteristic symptoms of gonorrheal ophthalmia and then apply the silver with the hope of destroying the germs; or shall we apply it immediately, knowing that if it is a case of gonorrheal ophthalmia we have aborted a severe attack, or, if it is a case of acute catarrhal conjunctivitis, the reaction from the silver solution, while great, lasts only a few hours under the

vigorous use of iced cloths? The treatment is conducted in the following way: Cleanse the eye with a solution of boric acid; take a strong pair of scissors, preferably straight with blunt points, placing one blade under the palpebral conjunctiva or the outer canthus, making the cut directly outward through the skin and conjunctiva. Then grasping the upper lid with the other hand, pull it forward and upward; in doing this you put the tarsal ligament on the stretch, and it can readily be found between the skin and the palpebral conjunctiva. This is cut by a smaller pair of scissors, and then the upper lid becomes loose and one is enabled to expose thoroughly the upper conjunctival cul-de-sac and so to lessen the pressure on the lymphatics supplying the cornea. Should there be much swelling and chemosis following the procedure, it is not necessary to stitch the edges of the wound together, as only a temporary effect from the operation is desired. The application of the solution of silver, forty grains to the ounce, should be made with a small pledget of cotton on an applicator, the operator being careful not to touch the cornea. Immediately neutralize the silver with a solution of chloride of sodium, and then begin the application of iced cloths, changing them every ten seconds until the reaction has subsided. In the meantime the eye is kept clean with a saturated solution of boric acid. It may be necessary to make a second application in twenty-four hours.

Antitoxin of Diphtheria as an Immunizing Agent.—Samuel S. Adams [2] presents the results of his researches on this subject. The immunizing dose was administered to 422 children, and in all cases of diphtheria the diagnosis was confirmed by bacteriological examination. The conclusions reached were as follows: 1. It was impossible to draw any definite conclusions as to the value of the immunizing dose of antitoxin. The author is convinced, however, that his dosage was too small, and that if more units had been given better results would have been obtained. 2. The average duration of the immunity, as revealed by the observations, conformed with that obtained by other observers. The author feels warranted in asserting that the larger the immunizing dose the longer the duration of the immunity. 3. The immunizing dose of antitoxin has no injurious effect upon the kidney. 4. Urticaria appeared in two cases, which was the only pathological effect of the antitoxin observed.

Atrophic Marasmus of Nurslings (so-called Hospitalism or Athrepsy of Parrot).—Adolf Baginsky [3] writes that no one can doubt that in all varieties of this affection bacterial influences have a place, and that the bacillus coli, the streptococcus, staphylococcus, pyocyanus, and pneumococcus play a certain rôle in the etiology; yet these influences are not such that we can attribute to them any specificity in the production of the anomalies of nutrition that result. The really efficient cause of the condition in children's asylums is the same as that which is at work in the homes of the poor. It is the want of proper

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and sufficient care. The errors are, perhaps, only slight, but they suffice, when added together, to produce the condition. In a series of researches on the metabolism of such cases, the author found that most of the loss of weight in the children was due to loss of nitrogenous substances. Thirty-seven and one-half per cent of the nutritive substances introduced into the intestinal canal were unassimilated and excreted again in the feces. Postmortem investigations showed that serious lesions existed, which were at times utterly destructive. These lesions were not of equal severity over the whole intestinal canal, and healthy parts lay in the neighborhood of parts that had suffered severely. In the diseased parts the destructive process involved the mucosa, with atrophy and sclerosis of the remaining tissues of the intestinal wall. The gastric mucous membrane was, as a whole, well preserved. In the upper part of the small intestine there was inflammatory proliferation; further on in the small intestine they took on an atrophic character. When the former process was in progress one could see peculiar prolongations and outgrowths of Lieberkühn's glands and of the villi, presenting an unusual bent and twisted conformation; while there was an overgrowth of the epithelial layer and an exudation of the round cells into the interstitial tissue. The process was evidently one of chronic catarrh, perhaps even associated with inflammation. In such a patch the submucosa and the muscularis are, on the whole, not much altered; at most there is noticeable a great overfilling of the blood vessels, with exudation of round cells. Close by such a patch, however, other patches may be found with perfectly unaltered mucous membrane and villi. In striking contrast to these one comes suddenly upon patches in which the most destructive processes are at work, the epithelial layer destroyed, and the villi and glandular layer almost completely gone. In place of the former glandular and villi layer nothing is left but collections of utterly irregularly deformed cells, some with enlarged or irregularly shaped muclei. The result of the whole process is the incapacity of the subject to assimilate and absorb the nutritive material ingested.

Black Tongue.—William S. Gottheil[4] reports a case of this disorder in a healthy, well-nourished child 2 years of age. The centre of the dorsum of the tongue was occupied by a dark greenish-black streak, commencing abruptly in front of the circumvallate papillæ and extending down almost to the tip. It was three-quarters of an inch wide posteriorly, narrowing gradually toward the anterior portion of the organ. The black streak was slightly elevated, its surface looked gelatinous, and it ended in a rather abrupt margin on either side. There was no apparent papillary hypertrophy, none of the thread-like excrescences which have been noted in many of the recorded cases. Most of the discoloration could be removed by a vigorous scraping. An immediate microscopic examination of the scrapings showed, in addition to normal epithelial cells and detritus, small, round, spore-like bodies. So abundant were

these peculiar structures that a light scraping consisted of them almost entirely.   They appeared as large, irregularly oval, semi-transparent bodies, showing a faint gray color under the lens.   There were no pigmented granules in them or the surrounding fluid.   They were unconnected with each other, were not arranged in series, and there was no mycelium.   Some of the oval bodies showed hemispherical projections (buds), but none of them showed cells in active proliferation.   The discoloration was removed in about a week by the use of a mouth wash consisting of a saturated solution of hyposulphite of soda.

Circumcision.—The technique of this operation is described by William L. Rodman.[5]   In drawing the prepuce over the glans, do not cut while you are still making traction on the prepuce, as you may, in that way, take off too much.   Pull it down to the lower point, then hold it with the forceps, being sure that the forceps is held obliquely so as not to include any portion of the glans, and snip off the prepuce in front of the forceps.   No matter how you cut, you will find that the mucous membrane is not cut on a line with the skin; it is so resilient that it gets out of the way of the knife or scissors.   You will have no vessels to tie, as stitches of fine catgut for approximating the surfaces will include the small artery on the dorsum of the penis   Stitches are, however, unnecessary in the infant, for approximation can be accomplished by means of a dressing of gauze with a hole cut in the centre, through which the glans is allowed to protrude.   This holds the cut surfaces together.   The dressing will not become soiled if a piece of rubber tissue is put over the gauze, a hole being cut in the tissue also.

Convalescence.—An editorial[6] calls attention to the fact that this is in some respects the most trying part of an illness, and during it the burdens of mother and nurse are doubled.   Under such circumstances, and in the case of a child but moderately sick, the character of the toys and playthings is worthy the attention of the physician.   They should be simple in construction so as to be easily understood, and few in number to avoid fatigue.   Too many toys at a time, too much amusement, too much attention may weary a weak, sick child depressed by illness, rendering him irritable, prolonging convalescence and delaying recovery.   So long as a child lies quietly and is amused with a simple toy, he should by all means be allowed to remain so.   The difficulty of finding articles which have slipped from the hand is particularly irritating to children, and can frequently be overcome by stretching a cord across the bed two or three feet above the child.   The toys may be suspended from this cord or tied to a larger cord.

Conical Stump following Intrauterine Amputation of the Arm—Edmund Owen[7] reports the case of a child who was born with the right arm absent from a little below the insertion of the deltoid.   In early infancy the end of the humerus was close against the skin which covered the central part of the stump.   Then it gradually worked its way through the

cicatrix, and its downward growth was unchecked, until it projected about three inches by the time the child reached 11 years of age. The author then advised amputation of some of the bone, cautioning the parents that it was quite possible after a few years for the bone to appear again. The surgeon should always be prepared for the contingency of a conical stump when he is amputating through the shaft of the humerus of a person who has not done growing, and, though with less apprehension, when he is operating through the leg.

Crying in the New-born, a Common Cause of.—Thomas S. Southworth[*] calls attention to the so called uric acid infarctions of Virchow, formed by the deposits of uric acid and urates in the straight tubules and papillæ of the kidneys in new-born infants, as a possible source of irritation as they remain *in situ* or are washed out by the scanty secretion of urine. It is extremely probable that much of the supposed pain of colic in infants, for which they have, from time immemorial, been dosed with fennel and other aromatic teas, is due to these sources of irritation in the kidneys, ureters, bladder, or urethra. Boiled water, which should be given to every infant at regular intervals for more reasons than one, pending the establishment of lactation, will dilute the urine and prevent or alleviate the discomfort.

Dangers of the "Long Tube" Nursing Bottle.—Ernest Wende[3] found that the prolonged effect of decomposed milk upon rubber will mash, mangle, and disintegrate it. This is due to the formation of lactate of zinc, which is soft and hygroscopic. Any foreign material or germs gaining entrance to the pits, sinuses, and porosities formed in the rubber by the macerating process, cannot be removed by any of the ordinary methods of cleansing, and it is doubtful if germs could be dislodged by any known germicide or chemical.

Diphtheria.—Theodore J. Elterich[6] reports 25 cases of laryngeal diphtheria treated by antitoxin and intubation. He considers all cases of pseudo membranous laryngitis, not of traumatic origin, as local manifestations of diphtheria, and bases the treatment on that diagnosis. The clinical diagnosis was in all cases that of diphtheria and was based on the progressive, unremitting laryngeal stenosis; added to this, the presence of the Klebs-Löffler bacillus. The distinctive feature in cases of larnygeal diphtheria is the progressive laryngeal stenosis, manifested by a very definite train of symptoms, as follows: hoarseness, aphonia, stridulous cough, stridulous respiration restlessness, dyspnea, and cyanosis. Three cases were injected on the first day of the disease, three on the second, nine on the third, five on the fourth, three on the fifth, and two on the seventh. The tube was worn two and a half days on an average. Four cases required no intubation. Five cases terminated fatally, a mortality of 20 per cent. When we consider that the mortality with other methods of treatment reached as high as 90 per cent (and reduced by intubation to 65 per cent), the author says we must acknowledge

that the results in the foregoing cases are highly gratifying. Antitoxin should be used as early in the disease as possible, and will often prevent the more serious operation of intubation. This operation should not be delayed too long. Restlessness and unremitting dyspnea are indications for intubation. The tube should be allowed to remain until the diphtheritic membrane has disappeared from the throat and the expectoration has become thin and viscid.

Diphtheritic Conjunctivitis.—George Huston Bell[1] reports a case cured by the administration of antitoxin. On the fourth day the child was getting worse in spite of treatment, and the antitoxin was injected. The injection was repeated the following day, after which the local and general symptoms rapidly subsided, leaving the eyesight unimpaired.

Inanition Fever.—Floyd M. Crandall[8] uses this term in describing an ailment in which there is a lack of proper nourishment during the first few days of life. The etiology of this condition is still a debated question. It is, no doubt, a fact that the radical changes in the bodily economy incident to the first days of life predispose to febrile conditions which would not occur after the functions of life had been fully established. It is quite possible that some urinary condition is an exciting factor, for the secretion of urine is usually scanty and a copious discharge of urates is frequently seen during the height of the fever. While the term "inanition fever" is not wholly satisfactory, it has the merit of impressing upon the mind the fact that it is accompanied, if not caused, by insufficient nourishment and will be cured by supplying that nourishment. The symptoms are quite characteristic and develop alike in robust and in weakly infants. On the second or third day the child, who has perhaps been quiet and restful, becomes irritable and restless It worries and cries, and sucks its fingers or anything it gets into its mouth. The mouth may be dry and the surface of body flushed, but the child does not always give distinctive evidence of the amount of fever present. Unless the thermometer is used the fever may be overlooked. The fever is usually at its height on the third or fourth day of life. It rises gradually during twenty-four or thirty-six hours, and is then liable to rise suddenly to its maximum point. The fall of temperature is sometimes very rapid if food is given freely. In some cases, however, the fall is gradual. Loss of weight during the first week of life is the rule with all children, but infants suffering from this fever lose weight much more rapidly and decidedly than do others. Diagnosis should be made partly by exclusion. Thorough inspection should be made of every part of the child's body, as well as a physical examination to exclude erysipelas, septic infection, and disease of the various internal organs. The mother's breasts should be examined to determine whether the milk supply is sufficient.

Inguinal Hernia in Children.—W. McAdam Eccles[10] believes that Nature tends to bring about a cure and that it should be the aim of the surgeon to aid her in this. The

rational palliative or non-operative treatment of the protrusion consists in the removal of any exciting cause, reduction of the contents, and the application of apparatus.   The diet should receive the utmost attention and the bowels be carefully regulated.   The author does not believe that phimosis has much to do with the production of a hernia, because a large number of boys are afflicted with phimosis who never become the subjects of herniæ, and congenital inguinal protrusions are decidedly frequent in Jewish male infants.   Reduction is usually easy, but it is often not a simple matter to keep the contents of the sac reduced.   For retention the author strongly recommends the steel spring truss.   Operative treatment of inguinal herniæ in childhood is only necessary in a small minority of cases. Operation may be advised in the following cases: (1) Where the child is being properly fed, but in whom a hernia, after a fair trial, is not retained by a suitable truss, so that there is little or no chance of a spontaneous cure.   (2) Where a part of the contents of the sac is irreducible.   (3) Where a truss has been worn for at least three years, but with no apparent cure of the protrusion.   (4) Where the child has reached the age of at least 3 years but has never worn a truss.   (5) Where herniotomy has to be performed for strangulation.

Laryngeal Growths in Young Children. — G. Hunter Mackenzie[11] believes that these growths may arise at three different periods of child life.   They may be there at birth, or they may be detected for the first time at any period up to about the sixth month of life with no appreciable exciting cause, or they may occur as a sequel of one of the exanthemata at any age up to the fifth or sixth year.   As to the frequency of these periods of commencement, the author is of opinion that congenital cases are less common than the others, which appear to be about equal in their frequency of occurrence. Similar growths occasionally develop in or invade the trachea, in which case some authorities believe them to be syphilitic. Such, however, is not the case with the laryngeal variety, for it does not respond to antisyphilitic remedies.   Nor, as others maintain, does the internal administration of arsenic affect it. The local application of alcohol has been recommended, but the author has had no experience with it.   When respiratory difficulty ensues, as it will in every case, sooner or later, relief must be given by tracheotomy.   Tracheotomy in this disease is not only palliative, but is also a curative procedure.   Removal of the growth is an inadmissible operation in young children, for the reason that direct interference with, or mechanical irritation of, the growths is almost always followed by rapid recurrence.   The author allows the tracheotomy tube to remain about six months, but it may be removed if the growths separate earlier.   It may be expected that some huskiness will remain for a year or longer after removal of the tube.

Lateral Curvature of the Spine.—In the course of an article upon this subject, Richard Barwell[11] writes that curvatures due to pelvic version are not only more immediately S-shaped,

but also more severe, than other forms of curve. Moreover, the difficulty of treatment, and, up to the present, its frequent want of success, is due to the fact that hitherto this mode of pelvic deviation has not been recognized and no measures have been employed, save by the author, for its correction. The failure may be due to two causes. The deformity may yield much too slowly and slightly to measures applied to the back alone; or it so far yields that both patient and surgeon, satisfied with the progress, deem that some relaxation of treatment may be allowed. Then, when return to treatment takes place, complete or almost complete recurrence of the malformity is found, simply because pelvic deviation, the source of the whole trouble, having been ignored, must from its very nature reproduce the evil it originally caused. Therefore the treatment of spinal curvatures due to pelvic malpostures must always be accompanied by measures for rectifying the pelvic deviation, for it is manifestly impossible to straighten a column and to keep it straight while the physical conditions about its base are such that balance can only be secured and maintained by curves and twists of the superimposed edifice. Unless the patient comes under treatment very soon after the commencement of the curvature, certain spinal muscles and ligaments will have become contractured, while those in the convexity are lengthened and enfeebled in their action. Hence cure is, even in somewhat slight cases, very much protracted, in severe cases impossible, unless the shortened structures be stretched by some external force; for they not only act as tie beams to the arch, but also as mechanical impediments to the action and remedial exercise of parts subtending the convexity. The quickest and, to the patient, the least irksome method of effecting this object is that which some years ago the author introduced under the name of " rachilysis " (" The Causes and Treatment of Lateral Curvature," 1895). In addition to this, the author recommends other devices, such as the sloping seat, the lateral sling, and respiratory and certain other muscular exercises.

Myxedema, Congenital; Improvement under Thyroid Treatment.—Sklarek's[12] patient is 17 years old and had been in an institution for idiots for years. She learned to walk when 7 years old. She was over 15 when treatment was begun, and it continued for sixteen months with marked improvement. The height increased fourteen centimetres, the weight almost six kilogrammes; the fontanelle closed, the scalp and skin became normal in color and texture; the expression of the face became friendly, new teeth appeared, and mentally she is brighter. Menstruation did not appear, even after the use of oöphorin tablets. When the thyroid extract was discontinued the myxedema symptoms began to return.

Oxyuris Vermicularis in Children.—George F. Still[13] has some observations on the subject, conclusions from which would seem to point as follows: 1. That the appendix vermiformis is a common habitat of oxyuris vermicularis in childhood. 2. That the generally accepted view that every single

ovum of oxyuris vermicularis must be swallowed before it can be hatched is at least open to doubt, and there is a strong probability that the appendix vermiformis serves in some cases as a breeding place for the threadworms. 3. That the presence of threadworms in the appendix may cause a catarrhal condition therein, as shown post mortem by a swollen appearance due to thickening of its wall. 4. That this swollen condition of the appendix due to threadworms is associated in some cases with pain in the right iliac fossa, which may simulate ordinary appendicitis. 5. That in the treatment of threadworms large injections must be used; and, in view of the difficulty of dislodging the worms from the appendix and their possible presence in the small intestine, the injections should be combined with the administration of drugs by the mouth.

Pelvic and Umbilical Abscesses in Children, Etiology of.—Schmid[14] reports six cases of pelvic abscess in children from 10 months to 13 years of age. In two (aged 8 years and 10 months respectively) the cause was a fall and a blow; in the other four no cause could be determined. Both traumatic cases ended fatally; the older child showed a primary abscess of the pelvic cellular tissue, the younger an abscess secondary to a lymphadenitis. Of the idiopathic cases three recovered after operation; the fourth died from perforation of the intestinal wall by a burrowing retroperitoneal abscess. Incision should be made as soon as there is fluctuation.

An umbilical abscess is reported in a year-old baby. It perforated spontaneously and was found to be situated in the abdominal wall, pointing toward the umbilicus. A second case, in a boy of 2 years, began in the umbilicus itself and healed perfectly. No signs of peritoneal involvement were present in either case.

Pneumonia in Children, Local Treatment in. — R. F. Chase[16] has come to the following conclusions as a result of his observations: That poultices diminish the pain when present, and that in doubtful cases the child often seems relieved. Thus in bronchitis accompanying either form of pneumonia the râles are often diminished and the dyspnea relieved. That they have a soothing effect, not infrequently disposing a fretful, restless child to sleep. That children rarely oppose their use. That the object of their use should be to relieve the various discomforts of this affection, thereby helping to preserve the strength of the child. The mustard paste so much advocated certainly seems of benefit. Some believe it is capable of limiting the affected area when used in the earliest stage, but it must be used with caution. No great claims are made for the cotton jacket, but it is so much better than a half-dozen thicknesses of superfluous clothing about the chest that the author occasionally resorts to its use. For hyperpyrexia he relies entirely on water and alcohol sponging. The ice cap has proved very beneficial in delirium and congestive headaches. In addition to these, a quiet room, fresh air, sunshine, and proper food are very necessary.

Polyuria and Incontinence of Urine; Symptoms of Adenoids.—Francis Huber [4] says that diabetes mellitus is rare in children, diabetes insipidus or polyuria rather more frequent. Under certain conditions, aside from the two referred to, the amount of urine passed by a child may be excessive. In rachitic children, especially those brought up on the bottle, the kidneys are very active and large quantities of urine are passed. The condition is not pathological, for it disappears as the child grows older and takes more solid food. Quite frequently in dispensary and private practice patients more or less neurotic, or with a neurotic family history, are presented who have dryness of mouth and tongue and parched lips with great thirst. In addition there is incontinence of urine both day and night, and larger or smaller amounts are voluntarily passed at intervals. The children are generally anemic, have headaches, suffer from cardiac palpitation, and are easily excited; they are restless, wake up frequently to moisten the parched lips and mouth, and have night terrors. They are listless and apathetic, and appear backward. There is a striking resemblance to diabetes insipidus, but an examination of the urine shows neither sugar nor albumin. In a further consideration of cases we find obstructed respiration, and when the patency of the naso-pharynx is restored the general condition improves. The relationship of cause and effect is evident. The adenoids, with or without associated naso-pharyngeal catarrh, cause mouth-breathing; the thirst is in a measure due to the parched state of mouth and tongue, and the child drinks more or less at frequent intervals. The result is evident in the large amount of urine secreted and passed. The true explanation is found in the changes in the blood and lymph circulation in the brain, induced by the lesion in the nose. In consequence of these changes the blood is surcharged with carbon dioxide or there is a deficiency in the amount of oxygen; the cerebral circulation (lymph and blood) is interfered with by the obstructive lesion in the nose; finally many products of cerebral tissue metabolism accumulate in the brain to produce the symptom-complex to which the term " aprosexia " has been applied.

Ergot, atropia, tonics of various kinds, roborant treatment generally, restriction of fluids, and the advent of warm weather may improve such cases, but only temporarily. To complete the cure the adenoids must be removed.

Prophylactic Measures, with Especial Reference to Infants and Children.—W. L. Johnson,[16] in writing upon this subject, refers to water as first and foremost—water " internally, externally, and eternally." The bath should include rinsing of the buccal cavity, scrubbing the teeth, if any, and even cleansing of the nostrils. To infants water internally is a necessity, as they do not get enough liquid in their milk to completely eliminate the waste products of the body. Urates are often deposited on the diaper because the baby does not get enough water to hold them in solution. It is an aperient, and given more freely to infants lessens the constipation so prevalent

in them. The mother while pregnant should be guarded against diseases, especially typhoid fever, malaria, and syphilis. If she has syphilis treatment must be instituted, and if she bears the treatment we may hope for a healthy child. Never tie the cord until it has stopped pulsating, as this prevents the infant from getting at least two ounces more of blood. The author believes that wool is the best material for clothing, as it prevents too rapid evaporation and thereby prevents too rapid cooling of the body surface. We must remember that heat production is less in infants and the aged, hence the greater precautions for maintaining it. Proper measures should be taken to preserve a good nervous system in young children. They should not be taken to the theatre or into a parlor full of admiring people, and should be sent to bed at an early hour.

Proteolytic Bacteria in Nurslings' Stools and their Significance in Pathology of Intestinal Diseases.—Spiegelberg [17] studied the stools of 50 infants (12 healthy, breast-fed; 11 dyspeptic; 17 severe gastro-enteritis; 10 diseases of other organs), and finds that the proteolytic bacteria are often present in milk, due to lack of cleanliness in the dairy. They cause a decomposition of the milk and form resistant spores. They are present in all artificially fed infants' stools, in small numbers, and increase in gastro-intestinal diseases. In certain severe cases some pathogenic varieties are apparently the etiological factor in the disease. Animal experiments proved them to be pathogenic. These bacteria seem to act only in atrophic, weak, and cachectic infants; they remain in the gastro-intestinal tract and do not enter the body generally. They are chiefly dangerous in that they prepare the way for the entrance of other more deadly bacteria. As a prophylactic measure cleanliness in the handling of milk is to be observed.

Psoriasis, Location on Vaccination Scars.—Bethman [18] reports a case which occurred in a boy of 12. After the vaccination pustule had healed, a psoriasis patch appeared on the scar, and the eruption spread to both arms, trunk, lower extremities, and scalp. As any external irritation may be followed by the local appearance of psoriasis, it is quite possible that in this case the vaccination may have acted as the provocative agent. It is a parallel case to that of Cazenave, in which psoriasis developed in the fresh scars of a cured variola.

Radical Cure of Spina Bifida.—James H. Nicoll, [19] in dealing with cases in which, after freeing the sac and its neck, he has opened it and found its interior free from nerve cords, simply cuts it away, closes its neck, and then sutures the mesoblastic flaps, and subsequently the skin flaps, over the stump. He no longer endeavors to prevent the escape of fluid from the sac during the operation. In cases in which the sac, being freed and opened, is found to contain nerve cords, a different plan is adopted in order to prevent damage to the nerves. Dissection of the cords off the interior of the sac is not free from risk. The author dissects the flaps of skin and mesoblastic tissues in the usual way. The sac is freed and opened. Such

portions as are free from nerve tissue are excised. The remainder is cut into ribbons by incisions made from the interior, parallel with the nerve cords incorporated with it. and thoroughly roughened with the point of the knife. The slashed and roughened sac is then placed in the patent spinal canal, over which the flaps are sutured in the usual way.

Some Diagnostic Signs in Children's Diseases.—A. Bienfait[20] gives a few symptoms which have recently been studied, and the presence of which, according to the best authorities, are presumptive evidence of the existence of certain infectious diseases.

1. *Koplik's Sign in Measles.*—This consists of an exanthem upon the mucous membranes, especially of the cheeks. consisting in small efflorescences of a bluish-white color surrounded by an inflammatory zone. They may be found on the tongue and lips; they vary in number, but there are usually from six to twenty on a side. They never become confluent. They usually appear on the first or second day of the prodromal period, increase up to the time of the eruption, and disappear at the end of three or four days when the skin exanthem is beginning to become pale. They are very characteristic in appearance and have never been found in any affection except measles.

2. *Palmo-plantar Sign.*—This is found in typhoid fever, and has been studied by Drs. Filipowicz, Achard, and Quentin, the latter having found it in 43 patients. It consists in a yellow coloration of the palms of the hands and soles of the feet, and is especially pronounced at the elevated parts. In the most typical cases the whole palmar surface of hands and fingers is dry, parchment-like, and of a lemon-yellow color, the surface over the head of the metacarpal bones being almost brown and the seat of hyperplasia. The most deeply colored portions of the sole are at the heel, and the head of the first and fifth metatarsal bones. In many cases the signs are more readily found on the hands than on the feet. During convalescence the affected parts are the seats of active desquamation. This sign attains its maximum intensity toward the fifteenth day and then remains stationary. During desquamation, if the superficial layers are lifted up by the nail of a finger, the deeper layers will be seen to be more deeply stained. The discoloration persists long after desquamation has ceased, sometimes as long as fifty days after the onset of the disease. This sign is found in nearly all cases of typhoid fever, but it has also, although rarely, been seen in rheumatism and tuberculosis.

3. *Meyer's Sign in Scarlatina.*—This sign was first noticed a year ago in hospital of the Porte d'Aubervilliers. In the most typical cases there is paresis of the extremities. but usually there is merely a swelling of both hands, with pricking or formication. Even the swelling may be absent, and there may be only a prickling sensation of the palmar surface of the ends of the fingers or in the hollow of the hand. In rare cases this sign is met with in the feet alone, or at the same time as in the

hands. It appears during the period of the eruption, exceptionally preceding it. It may last a few minutes only, but as a rule for two or three days with interruptions. Some patients perceive it only when they attempt to use their hands, as in holding a cup; others when they come out of a cold bath or when they dip their hands in water. Meyer has found this sign in 79 out of 100 cases. It has been found only in adults. It may be confounded with the itching due to the eruption, with the swelling of the extremities connected with the eruption, or with stiffness due to scarlatinal rheumatism.

4. *Whooping Cough.*—There is an excoriation of the mucosa of the frenum of the tongue which permits us to diagnose this affection in children examined between attacks and who have no further characteristic return of attacks. It is due to the scraping of the lower surface of the tongue against the incisors during coughing.

Streptococcus Enteritis in Infancy.—Escherich [17] gives the detailed results of his study of 15 cases of streptococcus enteritis in infants from 12 days to $2\frac{1}{2}$ years old. During the height of the disease the sero-mucous or muco-sanguino-purulent stools present a characteristic appearance under the microscope, in that streptococci are by far the most numerous bacteria present. They are either in the form of diplococci, round or lancet shaped, or in short chains of 5 to 8 elements; long chains of 20 or 30 cocci are more rare. Examinations prove that streptococci are frequently found in milk, even when this has been carefully handled, and it seems probable that the cocci enter the intestinal tract by means of the food or swallowed sputum. At the autopsy the intestines showed the lesion of catarrhal inflammation only, with marked swelling of the Peyer's patches in the lower ileum. Microscopically these patches and the solitary follicles in the colon were intensely inflamed and many showed a slight loss of substance. The streptococci were most numerous in the lower ileum, but present also in the colon together with other forms of bacteria. They enter the other viscera apparently only during the last septicemic stage. With one exception, lobular pneumonia, preferably in the posterior portions of the lungs, was present in every case. Clinically the cases may run a course like a dyspeptic catarrh, with local symptoms only; or there may be more severe local symptoms and a general toxic condition as well, as in cholera infantum; finally, the most grave cases are accompanied by the distribution of the streptococci in the urine and the blood, and are always fatal.

Results of Appendicitis.—E. J. Coittier [21] takes up the question of the ultimate condition of young patients suffering from appendicitis. The results of his investigations in 86 cases of children under 15 years of age were as follows:

1. Nineteen patients were *not operated* upon. Of these, 5 returned later with a fresh attack and were then operated upon; 13 have had no pain or trouble of any kind; 1 only has occasional slight colic.

2. *Appendicitis* operated upon immediately. These num-

bered 47; in 1 there was general peritonitis; in 3 only resection of the appendix was performed. Of these 47 patients, 28 have had *no trouble* since the incision and are in excellent health. Four had fistulæ; 1 of them had prolapse of the appendix in addition; all were operated upon and are in good condition. Eight had simple radical treatment, 6 had appendectomy in addition; these 14 patients are well. Three patients had slight eventration. Three children had a return of appendicitis and were subjected to delayed appendectomy; they are at present in good condition.

3. *Delayed operations*, 30. All in excellent condition.

4. Three observations of children who died respectively eight, one, and seven months after the operation, from intestinal obstruction due to strangulation of the intestines by bridles.

Tubercular Cervical Lymph Nodes.—Charles N. Dowd [22] gives the results of study based on 36 cases submitted to operation. When the cervical nodes are tubercular both the anterior and posterior chains are usually more or less involved, but those near the pharynx are usually larger and in a more advanced stage of inflammation than those below. The type of inflammation is slow, as a rule, but differs greatly in different individuals. Some constitutions seem to have the power of successfully battling with tubercle bacilli, and some bacilli are less virulent than others, hence the lymph nodes may become walled in by fibrous tissue, and may exist in this condition for years, remaining apparently quiescent or even undergoing calcareous degeneration. They may, however, suddenly become inflamed and suppurate; and in operations in such cases one finds a matting of fibrous tissue so dense about the nodes that it is difficult to define their boundaries. On the other hand, some constitutions show little ability to cope with tubercle bacilli, and in them there is a rapid spread of the inflammation from node to node, so that shortly after the first infection there are small nodules very widely disseminated. In operating on such cases one finds the nodes soft and very loosely held by their capsules, with no apparent fibrous tissue about them. The tendency of the disease in these cases is to spread rapidly. Between these two types there are all grades of variation. If left alone the tendency of the nodes is to break down, open through the skin, and discharge their contents. This process is slow, one node after another discharging its contents during months or years and leaving unsightly scars. Sometimes the tubercular inflammation extends to other organs. Clinicians of large experience with phthisis state that it is not uncommon to find phthisical patients who in their childhood had had diseased lymph nodes. The most common point of infection is believed to be the pharynx, which is so prone to inflammation in children, as shown by pharyngeal adenoids, hypertrophied tonsils, chronic pharyngitis, etc. Tubercle bacilli are frequently found in tonsils and adenoids not suffering from tuberculosis. Carious teeth, eczema, rhinitis, otitis, or any inflammation about the head may occasion enlarged lymph nodes, and they may become tubercular, but those which are in close

communication with the pharynx are usually the first ones affected. Diagnosis is not always easy. Inflammations of the cervical lymph nodes frequently follow the exanthemata, pharyngitis, tonsillitis, diseases of the scalp, and other affections. These ordinarily run an acute course; when the deep nodes are involved a phlegmon results, which is easily distinguished from tubercular inflammation; when the superficial nodes are involved, small abscesses may result or an inflammation which soon subsides. Hence, if a case is kept under observation for a time, the diagnosis between tubercular inflammation and acute infection by pyogenic bacteria is usually made with ease. There are, however, a few instances of chronic enlargement of the nodes which are most difficult of diagnosis—cases in whom the nodes are not greatly enlarged, nor is there any appreciable change in their size from month to month and little or no pain. A large proportion of such cases is without doubt tubercular. The tuberculin test has been found by some to be of considerable value, but it cannot be relied upon implicitly. The enlargement which is due to cancerous or syphilitic disease can usually be diagnosticated by the accompanying conditions. In regard to treatment, the general health should be attended to, no matter what else we do. The advantages of operative treatment as compared with the expectant plan, or the incision of separate nodes as they become softened, are that we substitute a rapid removal of the nodes for a process of slow discharge, we diminish the likelihood of general tubercular infection, and we leave scars which are far less deforming than those which result from the slow discharge without operation. In the operation itself one must, at first, be surprised to find how many more nodes will usually be found where prior to operation only a very few could be palpated. Longitudinal scars in the neck usually stretch, whereas transverse scars seldom do so. Hence it is recommended to make transverse incisions, unless there is extensive disease of the lymph nodes, in which case the longitudinal incision is necessary. The sterno-cleido-mastoid muscle should be cut, in many instances, in order to gain good access to the nodes which lie beneath it. Its ends should afterward be sutured with catgut. The author has never seen any ill effect from this, though Milton reports 2 cases of torticollis. The internal jugular vein may occasionally be cut or torn so as to need ligation, a procedure which is accompanied by little danger. The nerves which lie in the field of operation need not be injured so as to occasion deformity. In the posterior part of the incision branches of the cervical plexus are encountered; the superficial ones may be cut when necessary, the deep ones need not be injured. The spinal accessory in the sterno-cleido-mastoid muscles cannot always be preserved and may be cut without ill effect. Some of the lower filaments of the facial nerve may be cut in the incision which runs below the border of the jaw, and a slight temporary drooping of the lower lip near the angle of the mouth may result. This is hardly to be noticed and usually subsides within a few days. In cases noticed where it had not   .

subsided there had been abscesses with prolonged suppuration and incisions which extended above the border of the jaw. The patient seems to suffer no ill effect from extensive removal of the lymphatics, as a compensatory lymph circulation is probably soon established. If the statistics of cases not operated on are compared with those in which the diseased nodes have been removed, the result warrants one in advocating the removal by operation in all cases except those whose general condition unfits them for such a procedure.

Tuberculosis in the First Year of Life, Diagnosis of.— Bulius [17] has studied 27 cases of tuberculosis in babies from 4 to 12 months old, with autopsies in 24 of them. In some cases sufficient sputum is coughed up for examination; in others it can be obtained by swabbing the throat. Should the sputum examination prove unsatisfactory, the only diagnostic symptoms are certain changes in the skin and bones. On the other hand, it is quite possible to diagnose tuberculosis when certain combinations of symptoms are present and other diseases (rachitis) have been excluded. A history of infection or of heredity is important. Gradual wasting in spite of good appetite and digestion; swelling of the supraclavicular lymph nodes or of the inguinal; cough; a torpid or dyscrasic course of furunculosis or eczema, in the absence of other causes, point to tuberculosis. Fever and splenic tumor are not diagnostic symptoms.

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ITEMS.

THE WILLIAM F. JENKS MEMORIAL PRIZE.—The fifth triennial prize of five hundred dollars, under the deed of trust of Mrs. William F. Jenks, will be awarded to the author of the best essay on ' The Various Manifestations of Lithemia in Infancy and Childhood, with the Etiology and Treatment." The conditions annexed by the founder of this prize are, that the " prize or award must always be for some subject connected with obstetrics, or the diseases of women, or the diseases of children " ; and that " the trustees under this deed for the time being can, in their discretion, publish the successful essay, or any paper written upon any subject for which they may offer a reward, provided the income in their hands may,

in their judgment, be sufficient for that purpose, and the essay or paper be considered by them worthy of publication. If published, the distribution of said essay shall be entirely under the control of said trustees. In case they do not publish the said essay or paper it shall be the property of the College of Physicians of Philadelphia." The prize is open for competition to the whole world, but the essay must be the production of a single person. The essay, which must be written in the English language, or, if in a foreign language, accompanied by an English translation, must be sent to the College of Physicians of Philadelphia, Pennsylvania, U. S. A., before January 1, 1901, addressed to Richard C. Norris, M.D., chairman of the William F. Jenks Prize Committee. Each essay must be typewritten, distinguished by a motto, and accompanied by a sealed envelope bearing the same motto and containing the name and address of the writer. No envelope will be opened except that which accompanies the successful essay. The committee will return the unsuccessful essays if reclaimed by their respective writers or their agents within one year. The committee reserves the right not to make an award if no essay submitted is considered worthy of the prize.

JAMES V. INGHAM, M.D., *Secretary of the Trustees.*

THE AMERICAN PROCTOLOGIC SOCIETY was organized Wednesday, June 7, 1899 at the Chittenden Hotel, Columbus, O., during the meeting of the American Medical Association. The society is formed for the study of the diseases of the rectum, and its membership is composed of prominent rectal specialists of the leading cities in the United States. The following officers were elected: *President*—Dr. Joseph M. Mathews, Louisville, Ky., the retiring president of the American Medical Association; *Vice-President*—Dr. James P. Tuttle, New York City; *Secretary-Treasurer*—Dr. William M. Beach, Pittsburg, Pa.; *Board of Counsellors*—Dr. Samuel T. Earle, Baltimore, Md.; Dr. A. Bennett Cooke, Nashville, Tenn.; Dr. J. Royal Pennington, Chicago, Ill. The charter members, other than the officers, are : Dr. Joseph B. Bacon, Chicago; Dr. Leon Straus, St. Louis; Dr. B. Merrill Ricketts, Cincinnati; Dr. Thomas Charles Martin, Cleveland; Dr. S. G. Gant, Kansas City; Dr. Lewis H. Adler, Jr., Philadelphia; Dr. Charles C. Allison, Omaha; Dr. A. Bennett Cooke, Nashville; Dr. George B. Evans, Dayton, O.

THE ninth annual meeting of the AMERICAN ELECTROTHERAPEUTIC ASSOCIATION will be held in Washington, D. C., on September 19, 20, and 21, 1899, under the presidency of Dr. F. B. Bishop, of Washington. A number of papers of scientific value have been promised, and the Committee of Arrangements insures the members a very entertaining and pleasurable meeting. The headquarters of the association will be at Willard's Hotel, where special rates will be given to members and their families.

ORIGINAL COMMUNICATIONS.

A CASE OF SPONDYLOLISTHESIS, WITH DESCRIPTION OF THE PELVIS.[1]

BY

J. WHITRIDGE WILLIAMS,

Professor of Obstetrics, Johns Hopkins University; Obstetrician-in-Chief to the Johns
Hopkins Hospital.

(With one illustration in the text and four plates.)

Last July one of my assistants saw a woman in the dispensary of the Johns Hopkins Hospital, who had a curvature of the spine and one of whose hips was apparently higher than the other. He had not examined her, but thought from her appearance that she might have a Naegele pelvis, and brought her to me for examination.

She was a colored woman, J. T., 22 years old, 149½ centimetres tall (4 feet 10 inches), who stated that she was in the ninth month of her first pregnancy, her last menses having occurred on the 15th of November, 1897. The pregnancy had been uneventful and she had come to the dispensary to ask the

[1] Read in abstract before the American Gynecological Society, May, 1899.

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care of the Out-patient Obstetrical Department in her approaching confinement.

On external palpation, I found the fundus of the uterus three fingers' breadth beneath the ensiform cartilage. The fetus was felt with its head in the right iliac fossa, its small parts on the left side and its back extending across the upper part of the abdomen. The fetal heart was heard on the right side of the mother, midway between the costal margin and the umbilicus. The external pelvic measurements were 24, 27, 20, and 18 centimetres.

The patient was then undressed and examined in the upright position. When viewed from the front, it was noticed that her abdomen was markedly pendulous and that there was apparently a slight asymmetry between the hips, the right being larger and more prominent than the left. Just above the right hip there was a slight concavity, while on the left side the body extended in practically a straight line from the thorax to the trochanter. At first glance, it appeared that the pelvis was tilted obliquely upward on the right side, but actual measurement showed that this was not the case, as the distance from the crest of the right ilium to the floor was 94 centimetres and the corresponding distance on the left side $93\frac{1}{2}$ centimetres. On placing the hands upon the iliac crests, it was noticed that they were almost in contact with the costal margins, though the patient's body did not appear markedly shortened.

When the patient was viewed from behind, I noticed a slight scoliosis involving the lower dorsal and the entire lumbar portion of the vertebral column, with its convexity directed to the left, and a compensatory curve in the opposite direction in the upper part of the vertebral column. Just above the buttocks a rounded protuberance 2 centimetres wide and $1\frac{1}{2}$ centimetres high projected from the middle line of the vertebral column. The skin was freely movable over it, and it was thought to represent the spine of the last lumbar or the first sacral vertebra.

When viewed from the side (Fig. 1), the patient presented a moderate degree of lumbar lordosis, and the above-mentioned protuberance was clearly seen. The abdomen was markedly pendulous and at once suggested that a greater disproportion existed between the child's head and the pelvic canal than was indicated by the external pelvic measurements.

Although the possibility of an obliquely contracted pelvis had been dismissed upon finding the crests of the ilium at the

same level, the various measurements, which were recommended by Naegele for its detection, were made and found to be alike on both sides.

On vaginal examination, the vaginal outlet was large and there was no trace of a hymen, its place being taken by several

FIG. 1.—Patient seen from left side; drawing from a photograph.

carunculæ myrtiformes. The cervix was bilaterally torn, especially on the left side.

The lower portion of the sacrum was palpable and was concave in both directions. What appeared to be the promontory was readily reached, and my attention was immediately arrested by the sharp angle which it formed with the rest of

the sacrum. The finger was then passed upward over the anterior surface of the sacrum and, instead of coming in contact with its promontory, was arrested by a structure which overhung it and formed a triangular space in front of it.

On further examination, it was found that this structure was the body of the fifth lumbar vertebra, which had been so displaced downward as to cover completely the anterior surface of the first sacral vertebra, its lower margin being opposite the articulation between the first and second sacral vertebræ. On passing the finger further upward, the bodies of the fifth and fourth lumbar vertebræ could be palpated. The bifurcation of the aorta, however, could not be felt.

A spondylolisthetic pelvis was thought of at once, and the diagnosis assured by sweeping the finger along the linea innominata, when it came in contact with the displaced last lumbar vertebra, instead of continuing on the promontory of the sacrum. As the promontory was covered by the last lumbar vertebra, the oblique conjugate could not be measured, but the distance from the upper margin of the last lumbar vertebra to the lower margin of the symphysis pubis was $9\frac{1}{2}$ centimetres (pseudo-conjugata obliqua). The pelvic outlet was somewhat contracted, but, unfortunately, accurate measurements were not made.

Having diagnosed a spondylolisthetic pelvis, I asked Dr. L. C. Neale, Professor of Obstetrics in the University of Maryland, to see the case with me, and the following day we examined her under anesthesia and completely confirmed the findings of the previous examination.

In view of the lacerated condition of the cervix, the probability of a previous pregnancy was considered, but the patient repeatedly and positively denied its occurrence.

Having made the diagnosis, we attempted to obtain the past history of the patient, in the hope of finding some clue to the etiology of the deformity, and found that she had been perfectly healthy until her thirteenth year, when she had fallen on the ice while skating and injured her right hip. At that time she did not appear to be much hurt and walked home and was not confined to bed. She recovered rapidly and in a few days was perfectly well. About six months later, she had rheumatic pains in both hips and knees. She did not go to bed, nor did she think that she had fever or that her joints were swollen. Some time after this she noticed that her right hip was higher than the left. During the next two or three years this deform-

ity gradually increased, but has remained stationary for the
past five or six years.

She states that ordinarily she does not have any trouble from
her deformity, but occasionally in damp weather her hips are
painful. She has always been accustomed to hard work, and
often carries baskets of clothes or bundles of wood, which she
carries on her right side, allowing them to rest on the hip, as
it is difficult for her to carry anything in front of her without
falling forward. On making her walk, it was found that she
had the characteristic gait to which Neugebauer first called
our attention.

After diagnosing the pelvic deformity and considering that
the pelvic inlet was probably still more encroached upon by the
forward displacement of the lower portion of the vertebral col-
umn than was indicated by the pseudo-oblique conjugate, both
Dr. Neale and myself agreed that the most conservative meth-
od of delivery would be by Cesarean section at or about term.
The operation was proposed to the patient and her friends, but
they positively refused to allow its performance and persisted
in their refusal in spite of all our efforts.

As the patient would not consent to the operation, I went
away for my vacation and left the case in the care of my assist-
ant, Dr. Dobbin, expecting to return and do a Cesarean section
after she had gone into labor, when in all probability she would
be more amenable to persuasion. A few days later, the patient
admitted to Dr. Dobbin that she had given birth to a child four
and a half years previously, when she was about 18 years of age.
The labor was conducted by a midwife and was spontaneous
and comparatively easy, the child being alive at the present
time. When Dr. Dobbin informed me of this, I concluded that
the vertebral column did not obstruct the pelvic inlet to so
great an extent as we had supposed, and wrote him that I be-
lieved that she could be delivered by symphyseotomy.

She went into labor on the evening of the 29th of August,
and, upon vaginal examination a few hours later, Dr. Dobbin
found the cervix almost completely dilated, with the membranes
bulging into the vagina. The head presented by the brow and
was freely movable above the pelvic brim; the external exam-
ination giving the same results as at the first examination. In
my absence, Dr. Dobbin asked Dr. W. W. Russell to see the
case with him, and they both agreed that she could probably be
delivered by symphyseotomy.

She was anesthetized and the operation performed by Dr.

Dobbin. After cutting through the symphysis in the usual way, the right leg of the child was seized and version performed with considerable difficulty. The body was then slowly extracted and the head delivered with great difficulty by the Mauriceau maneuvre. While delivering the child there was considerable hemorrhage, and the symphyseotomy wound tore into the vagina, necessitating packing it firmly with gauze; and consequently the exact amount of separation between the ends of the pubic bones could not be ascertained, but Dr. Dobbin estimated that it was between eight and nine centimetres during the extraction. The child was born asphyxiated, but was soon resuscitated. The vaginal tear was closed with catgut sutures and the symphyseotomy wound closed in the usual way.

The patient was considerably shocked after the operation, but rallied well. On the third day there was marked distension of the abdomen and the greatest difficulty was experienced in getting the bowels to act. The distension continued, but was relieved by the use of the rectal tube. The patient did fairly well for the first five or six days; but at no time was her condition perfectly satisfactory, the bowels always remaining sluggish and the abdomen more or less distended. On the fifth day the dressings were removed and the wound appeared in good condition. On the seventh day the wound was again inspected, when it was found to have broken down to a great extent. Half an hour afterward the patient began to complain of air-hunger, and died within a half-hour, presumably from pulmonary embolism. At no time during the puerperium were there any symptoms of peritonitis, and only twice did the temperature reach 102°. The pulse remained persistently high from the time of the operation and averaged about 130.

Unfortunately, the autopsy could not be performed until four or five days after death, on account of the difficulty experienced in communicating with her relatives, who lived in an inaccessible place on the Eastern Shore of Maryland, so that the body was markedly decomposed when the autopsy was performed and only the grossest lesions could be made out. It was found that nearly all of the stitches had pulled out, only the lowest silver suture through the anterior pubic ligament having remained in place. The entire space between the bladder and the symphysis pubis was converted into a large pus cavity. There was a deep laceration extending from the left side of the cervix up into the broad ligament, which extended behind the cervix

over to the left side. There were no signs of peritonitis, but, owing to the marked decomposition, no trace of an embolus could be found.

The pelvis was examined *in situ*, and, after bringing the ends of the pubic bones together, the following measurements were made : Superior strait: Pseudo-conjugata obliqua, 9.5 centimetres (which exactly corresponds with the measurements made during life) ; pseudo-conjugata vera, 7.5 centimetres; narrowest part of superior strait, from superior margin of pubis to lower margin of third lumbar vertebra, 6.5 centimetres; transverse diameter, 12.1 centimetres: right oblique, 12 centimetres; left oblique, 12 centimetres. Inferior strait: Antero-posterior diameter, 10.75 centimetres; between ischial spines, 9.5 centimetres; transverse diameter, tuberosities, 8.5 centimetres.

The entire pelvis was then removed with the last three lumbar vertebræ and the upper portions of the femora.

Description of the Pelvis.—The pelvis, after maceration, impresses one as being somewhat smaller than usual. But its striking feature is the relation which the vertebral column bears to the sacrum: for the body of the last lumbar vertebra, instead of articulating with it in the usual manner, is displaced downward and forward to such an extent as to completely cover the anterior surface of the first sacral vertebra (Fig. 2). And consequently the vertebral column appears to have prolapsed into the pelvis and encroaches markedly upon its cavity, giving the superior strait a distinctly reniform appearance.

The pubic arch is somewhat narrower than usual, and the inferior strait is markedly contracted in its transverse diameter, thereby giving the pelvis a funnel shape.

The pelvic measurements are as follows: Superior strait: Antero-posterior diameter, 7.6 centimetres (from symphysis pubis to lower margin of fourth lumbar); transverse, 12.1 centimetres ; right oblique, 12 centimetres ; left oblique, 12 centimetres.

Inferior strait: Antero-posterior diameter, 10.75 centimetres; transverse, 8.5 centimetres ; distance between ischial spines, 9.5 centimetres.

Plane of greatest pelvic dimensions (*Beckenweite*): Antero-posterior diameter, 12.8 centimetres; transverse, 11.9 centimetres.

The antero-posterior diameter of the superior strait (7.6 centimetres), from the posterior and upper margin of the symphysis

pubis to the lower margin of the fourth lumbar vertebra, was not the shortest distance between the symphysis and the vertebral column; but this was found between the upper and posterior margin of the symphysis and the lower margin of the third lumbar, which measures 6.5 centimetres, while the distance to its upper margin is 7 centimetres.

The distance between the lower margin of the symphysis and the upper and lower margins of the fifth lumbar vertebra measures 9.5 and 11 centimetres respectively.

The pelvic inclination is entirely obliterated; for, on placing the pelvis in such a position as to give the vertebral column an upright direction, the plane of the superior strait is parallel to the horizon, and a line drawn horizontally backward from the upper margin of the symphysis impinges upon the anterior surface of the fourth lumbar vertebra about one centimetre above its lower margin. On giving the pelvis its normal inclination, with the cotyloid notches directed downward, we find that the vertebral column assumes a horizontal position; so that the woman would have been obliged to walk on all fours had the normal pelvic inclination been retained.

Owing to the change in the pelvic inclination, the ileo-femoral ligaments were under marked tension, as is indicated by the prominence of the anterior inferior spines of the ilium and the markedly corrugated and eburnated condition of the external surface of the iliac bones just posterior to them.

DESCRIPTION OF PLATES.

Fig. 2.—Sacrum and last three lumbar vertebræ seen from the front.

Fig. 3.—Sacrum and last three lumbar vertebræ seen from the left side. *a*, last intervertebral foramen ; *b*, transverse process of fifth lumbar vertebra ; *c*, anterior fissure on outer side of left interarticular portion; *d*, posterior fissure on outer side of left interarticular portion ; *e*, articulation between inferior articular process of the fifth lumbar vertebra and the superior articular process of the first sacral vertebra.

Fig. 4.—Vertical mesial section through sacrum and last three lumbar vertebræ. *a*, fissure on inner side of left interarticular portion.

Fig. 5.—Fourth and fifth lumbar vertebræ as they would appear if completely separated. *a*, superior articular process of fourth lumbar vertebra; *b*, transverse process of same; *c*, inferior articular process of same with depression on its lower margin; *d*, portion of the lamina of the fourth lumbar which articulates with superior surface of the lamina of the fifth lumbar vertebra; *e*, superior articular process of the fifth lumbar vertebra ; *f*, inferior articular process of same; *g*, transverse process of same; *h*, anterior fissure on the outer side of the left interarticular portion; *i*, posterior fissure on outer side of left interarticular portion; *j*, flattened surface on the lamina of the fifth lumbar which articulates with *d* on the fourth lumbar vertebra.

Fig. 6.—Reconstruction of the left side of the fifth lumbar vertebra as seen from below. *a*, body of vertebra; *b*, transverse process; *c*, inferior articular process; *d*, spinous processes; *e*, fissure on the inner margin of the left interarticular portion; *f*, anterior fissure on the outer margin of the left interarticular portion; *g*, posterior fissure on the outer margin of the left interarticular portion.

S. Montague fec

FIG. 2.

SPONDYLOLISTHESIS.—WILLIAMS.
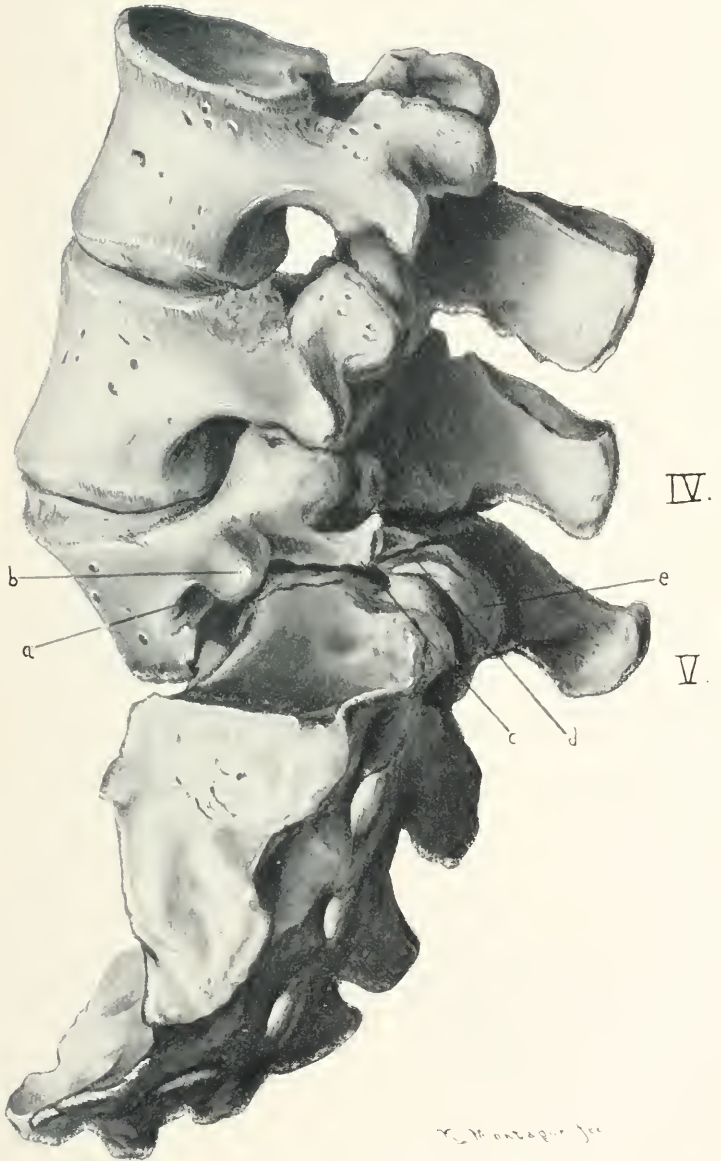
FIG. 3.

SPONDYLOLISTHESIS.—WILLIAMS.

IV.

V.

a
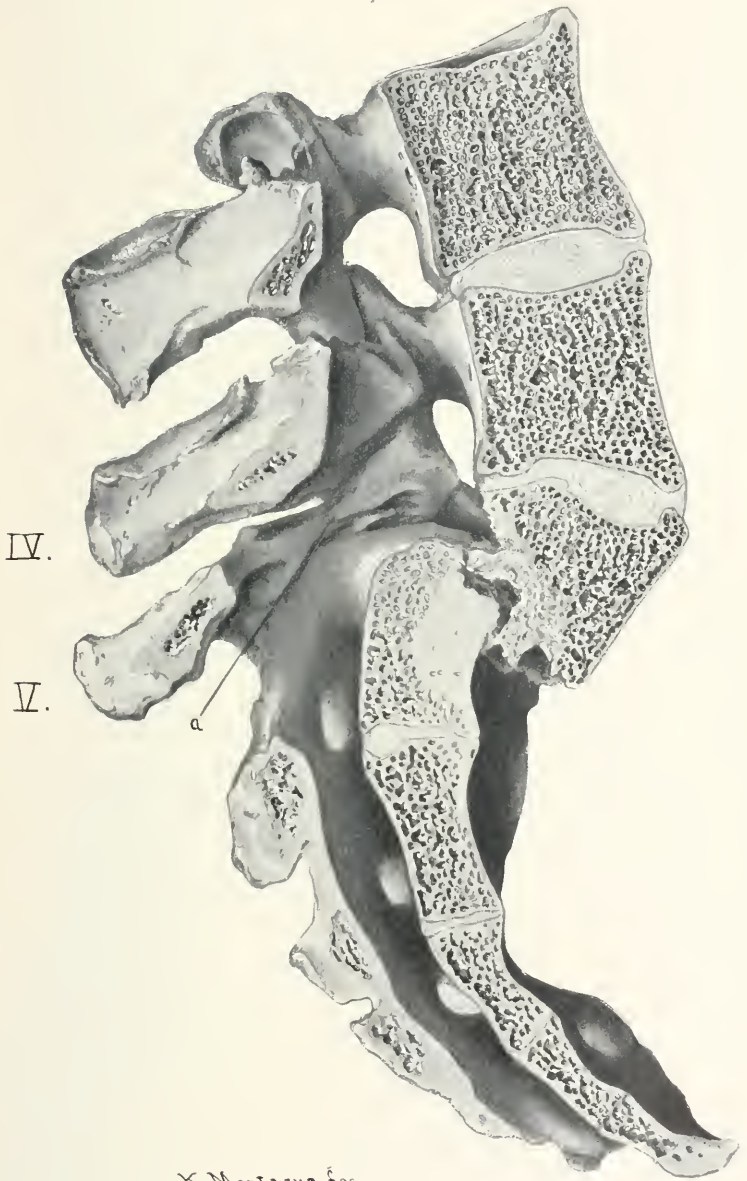
K. Montague. fec

FIG. 4.

SPONDYLOLISTHESIS.—WILLIAMS.

K. Montague

FIG. 6.
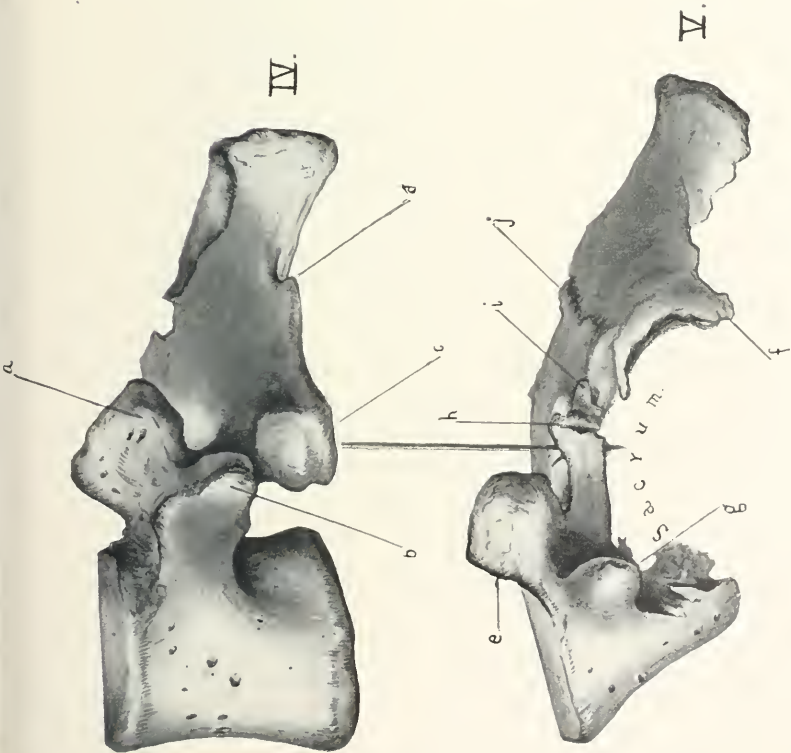
K. Montague fec

FIG. 5.

SPONDYLOLISTHESIS.—WILLIAMS.

The posterior surface of the sacrum presents a normal appearance, there being no defects in the sacral arches. The entire vertebral column is slightly deflected to the left, so that the centre of the superior surface of the third lumbar vertebra lies 0.5 centimetre to the left of the median line. The spine of the fifth lumbar vertebra projects 1.3 centimetres beyond the spines of the other lumbar vertebræ, and on examination we find that the former occupies its usual position, while the latter are displaced forward. On looking at the sacrum and vertebral column from the side (Fig. 3), we find that the body of the fifth lumbar has assumed a triangular form, and that the intervertebral foramina have undergone marked changes in shape; the foramina between the third and fourth vertebræ presenting their usual appearance, and those between the fourth and fifth vertebræ being somewhat compressed antero-posteriorly, while the foramina between the last lumbar and first sacral vertebræ are almost obliterated and are converted into mere slits, about 0.3 centimetre in vertical diameter.

We also notice that the lower articular processes of the last lumbar vertebra are firmly synostosed with the upper articular processes of the first sacral vertebra, so that no trace of the original joints can be found. The superior articular processes of the fifth and the inferior articular processes of the fourth lumbar vertebræ are also densely fused together.

Instead of being in the same vertical line, the inferior and superior articular processes of the last lumbar vertebra are widely separated from one another, the former occupying their normal position, while the latter are situated about 2 centimetres anterior to them.

On looking at Fig. 3, which represents the sacrum and the last three lumbar vertebræ, seen from the left side, we find that this separation is due to a marked lengthening and flattening of the interarticular portion of the vertebra, which is converted into a plate of bone 1.8 centimetres long, which varies from 0.35 to 0.5 centimetre in thickness. In the centre of the left interarticular processes (Fig. 3) is a vertical fissure, less than 1 millimetre in width, with prominent raised margins. This constitutes the thickest part of this portion of the vertebra. One-half of a centimetre posterior from its upper margin, is a second fissure (Fig. 3), whose margins are in close apposition, and which appears to extend obliquely downward and forward through the entire thickness of the interarticular portion, which is accordingly divided into three parts. The same con-

ditions are observed on the right side, except that the inter-
articular portion is traversed by only a single vertical fissure,
which divides it into two equal parts.

A vertical mesial section was then made through the sacrum
and lumbar vertebræ (Fig. 4), which shows very clearly the
salient features of the deformity. Here we see that the entire
vertebra is lengthened and that its body is triangular in shape
and lies almost entirely in front of the first sacral vertebra.
Its neural canal is increased in its antero-posterior diameter,
its interarticular portion thinned out and lengthened, and the
entire vertebra bent over the superior surface of the sacrum,
so that we can designate it as a dolicho-kyrto-platy-spondylus
(Lambl).

Upon closer examination, we find that the only portion of the
body of the last lumbar vertebra which has retained anything
like the normal appearance is its anterior surface, which is
straight in place of being concave from above downward. Its
superior surface, instead of being concave throughout, is con-
cave anteriorly and flat posteriorly. And, on glancing at the
drawing, it is apparent that the body weight was transmitted
to the anterior part of the sacrum through this flattened poste-
rior portion. The greater part of its posterior and inferior sur-
faces has been worn away where they come in contact with the
promontory of the sacrum, so that only 0.8 centimetre of the
former and 1 centimetre of the latter have been preserved.

Coincident with these changes, the anterior and superior
surfaces of the first sacral vertebra have also become involved,
but to a less marked degree, so that all trace of the promon-
tory has disappeared and its place taken by an irregularly
shaped depression, the lower margin of which roughly fits into
a corresponding concavity upon the posterior and inferior sur-
face of the last lumbar vertebra. And it appears that the
upper margin of this concavity—a plate of bone 0.5 centimetre
long and 0.25 centimetre thick—is all that serves to connect
the bodies of the two vertebræ.

The greater portion of the body of the last lumbar vertebra
presents its typical spongy structure on section; but the mar-
gins of the concavity are dense and white and appear sclerotic
and eburnated. This condition is still more marked in the
first sacral vertebra, whose anterior portion presents an almost
ivory-like appearance over an area $1\frac{1}{2}$ by 1 centimetres.

There is no trace of an intervertebral cartilage where the
two bones are in contact. Before cleaning the pelvis, however,

there was a considerable amount of fibrous tissue in the triangular space between the inferior surface of the body of the last lumbar and the anterior surface of the first sacral vertebra, which probably represents all that was left of it.

The neural canal of the last lumbar is markedly lengthened and measures $3\frac{1}{2}$ centimetres in its antero-posterior diameter. This disproportion is due to a lengthening of the interarticular portion, which on the left side presents a vertical fissure in its central part (Fig. 4), while on the right side two fissures are apparent, one about the centre and the other at its anterior end. The margins of all the fissures are in close apposition (Fig. 6).

The body of the fourth lumbar vertebra appears to have undergone pressure changes, as its anterior surface is 0.9 centimetre higher than its posterior. Its neural canal is likewise somewhat elongated, measuring 1.5 centimetres in its greatest antero-posterior diameter. Its interarticular portions, however, do not appear to have undergone any change.

On the superior surface of each lamina of the fifth lumbar, vertically above the inferior articular process, is a slight bony prominence (Fig. 5, *j*), which lies in apposition with a flattened surface upon the lower margin of the lamina of the fourth lumbar vertebra (Fig. 5, *d*).

In order to make a more careful preparation, the left half of the sacrum and vertebral column was soaked for a few minutes in warm water, when it was found that a certain amount of motility existed. And on making pressure upon the latter, the body of the last lumbar vertebra could be still further displaced over the anterior surface of the sacrum. This was rendered possible by motility at the fissures in the interarticular portion; and, by pressure upon the vertebral column, the margins of the fissures could be seen to separate for several millimetres, when the space between them was found to be filled by a fibrous mass. No trace of a joint cavity could be observed, and we believe that the union between them was syndesmotic in character.

Upon further preparation, the left half of the specimen was readily separated into two parts: an anterior, consisting of the third and fourth lumbar vertebræ and the anterior portion of the fifth, and a posterior, consisting of the sacrum and the posterior part of the last lumbar vertebra. The anterior half of the last lumbar consists of its body and the greater part of its interarticular portions, while the posterior half consists of its spine, laminæ, and the remainder of the interarticular portions.

The left interarticular portion is then seen to be a quadrilat-

eral plate of bone 2 centimetres in diameter, with a large opening in its centre through which projects the lower articular process of the fourth lumbar vertebra. This opening is oval in shape and measures $1\frac{1}{2}$ by 1 centimetres, with its greatest diameter extending antero-posteriorly. Its outer margin measures 0.5 centimetre at its thickest part and is divided into three portions by the two fissures already mentioned. The inner margin is slightly thicker and is divided into two portions by an oblique fissure (Fig. 6). The interarticular portion, posterior to the margin of this opening, is firmly synostosed with the superior surface of the sacrum.

The right side of the specimen presents, after soaking, the same motility as the left, and like it could have been separated into two parts. This was not done, as we wished to preserve the specimen. By cleaning out the tissue, however, which lay between the last lumbar vertebra and the base of the sacrum, we were enabled to study the condition of the right interarticular portion, which we found measured 2 and 0.5 centimetres in its widest and thickest parts, respectively. Just as on the left side, its centre was occupied by an oval opening, through which the lower articular process of the fourth lumbar protruded, the apex of which reached to within 0.2 centimetre of the base of the sacrum; while on the left side the lower articular processes rested upon the base of the sacrum, and had worn away the outer compact layer of the latter, producing a depressed oval area, 0.5 by 0.8 centimetre, whose base was composed of spongy bone. This area is 1.3 centimetres from the median line, and its long axis corresponds with the antero-posterior diameter of the body of the sacrum. This condition of the lower articular processes of the fourth lumbar affords a satisfactory explanation for the scoliosis which was noted during life.

Fig. 6 represents a reconstruction of the last lumbar vertebra, looked at from below, and clearly shows the condition of the left interarticular portion.

Fig. 5 represents the fourth and fifth lumbar vertebræ, which we have imagined separated from the synostoses which firmly unite them. At the lower margin of the left lower articular process of the fourth lumbar, we note a depression, which was produced where it came in contact with the margin of the opening in the interarticular process of the fifth lumbar.

History.—The specimen which I have just described is a marked example of spondylolisthesis, and is of interest, not

only because of its rarity, but especially on account of the peculiar change in the shape of the last lumbar vertebra, concerning whose production so much has been written.

We shall accordingly study the etiology of our case, and attempt, if possible, to discover the factors which played a part in its production. But before doing so we shall briefly consider the history of spondylolisthesis, especially from an etiological point of view.

The term spondylolisthesis (from σπόνδυλος, *vertebra*, and ολίσθησις, *sliding*) was first used by Kilian in 1853, and applied by him to two pelves, which were markedly deformed by the downward and forward displacement of the lower lumbar vertebræ into the pelvis. One of the cases occurred in Paderborn and the other in Prague, and in both the pelvic deformity was so marked as to necessitate the performance of Cesarean section. Kilian attributed the deformity in both cases to a downward and forward displacement of the fifth lumbar vertebra over the promontory of the sacrum, which he believed was rendered possible by an inflammatory softening of the last intervertebral cartilage and the surrounding ligaments, as well as of the vertebra itself.

In 1854 he published his "Schilderungen neuer Beckenformen," in which he again described the Paderborn and Prague pelves, and added the description of two other pelves which Rokitansky had previously described as "kyphotic." Kilian considered that the deformity in one of them was probably of congenital origin, while in the other he was inclined to attribute it to a hydrorrhachis in the lower lumbar and upper sacral portion of the vertebral column.

Kilian's first communication was reviewed by Ritgen, who suggested that the increased size of the neural canal of the fifth lumbar was possibly the result of a hydrorrhachis. Kilian, however, in his second article, did not accept this suggestion for the first two cases, but, as we have already indicated, admitted its possibility in one of Rokitansky's cases.

In 1855, Breslau described a case of spondylolisthesis from the Pathological Museum of Munich, and, like Kilian, attributed its production to degenerative changes in and about the last intervertebral cartilage; and, six years later, when describing another case, found no reason to modify his original opinion.

Robert, in the same year, described a very marked case of lumbar lordosis in a 4-year-old girl, which had existed from

the time she began to walk, and which he considered was of spondylolisthetic origin, though he was unable to make a positive diagnosis, as a vaginal or rectal examination could not be made.

He also considered the mechanism by which spondylolisthesis may be produced, and stated that in such cases too little attention had as yet been paid to the condition of the posterior part of the last lumbar vertebra.

He then performed a number of experiments upon cadavers, by which he demonstrated that softening or even destruction of the intervertebral cartilages and the various ligaments would not permit a forward displacement of the entire last lumbar vertebra, so long as the articulations between its lower articular processes and the upper articular processes of the sacrum were preserved. And he stated "that it is impossible for the fifth lumbar to be displaced forward as long as these processes remain intact, and can only occur as a result of pathological changes by which the articular processes of one or other vertebra are destroyed or broken off; or by the upper articular processes of the sacrum becoming so widely spread apart that those of the last lumbar can pass between them; or, finally, by the articular processes of the last lumbar being completely dislocated over the tops of the sacral processes.   A further possibility for the displacement of the body of the last lumbar over the anterior surface of the first sacral vertebra may be afforded by a general increase in the size of the inter-vertebral arch or the neural canal, by which the lower articular processes become so far removed from the body of the vertebra that it can slide forward without impairing the integrity of the joints between the articular processes."

Lambl, in his monograph upon the subject in 1858, thoroughly reviewed the work of his predecessors, and personally examined the pelves which they had described, and concluded as the result of his studies that the cause of the deformity in the Prague and Munich pelves was to be found in an accessory and rudimentary sixth lumbar vertebra, which was developed only in its posterior portion, and which was interpolated between the fifth lumbar and first sacral vertebræ in such a manner as to facilitate the dislocation of the inferior articular processes of the former over the tips of the superior articular processes of the latter. In the other three pelves, which had been described up to that time, he demonstrated a marked enlargement of the neural canal and a lengthening and thin-

ning of the interarticular portion of the fifth lumbar vertebra, which readily explained the production of the deformity. He believed that these changes in shape were secondary to a hydrorrhachis, which in some instances so interfered with the ossification of the interarticular portion that each vertebral arch consisted of two pieces of bone, which were united by a pseudo-arthrosis or syndesmosis. This condition he designated as spondylolysis, and pointed out that it did not occur infrequently, as he had observed it in several vertebræ, which otherwise appeared perfectly normal.

While believing that hydrorrhachis was the essential and primary factor in the vast majority of cases, Lambl admitted theoretically that a fracture of the interarticular portion might occasionally be the starting point of the deformity.

Blake, of San Francisco, in 1867 described the first American case, and did not hesitate to make a positive diagnosis from the clinical examination of the patient. He attributed the deformity to a very rapid increase in the weight of the patient in her first pregnancy, during which she gained 98 pounds.

Hugenberger, in a clinical observation, attributed the production of the deformity to a luxation of the last lumbar vertebra or a fracture of its articular processes, as the patient dated her trouble from a fall out of bed; and Weber-Ebenhof likewise considered that luxation was the essential etiological factor in two cases which he observed in Prague.

A considerable number of observers, on the other hand, among whom may be mentioned Blasius, Ender, Didier, Herrgot, and Van der Bosch, sought the primary cause of spondylolisthesis in a carious process in and about the sacrum and the last lumbar vertebra.

By far the most important of the earlier contributions to the etiology of the affection is to be found in the Marburg dissertation of Königstein, which appeared in 1871. Königstein became interested in the subject after the examination of a small collection of vertebræ in Marburg, all of which presented areas of deficient ossification in their interarticular portions. He also performed a number of experiments upon cadavers, which completely confirmed Robert's previous work, and enabled him to state that forward dislocation of the entire last lumbar vertebra could not occur so long as the joints between the articular processes of the last lumbar and first sacral vertebræ remained intact. He also stated, as far as he could see, that there was nothing about the various pelves, which he had

examined, to lend the slightest support to Lambl's hydror-
rhachis theory; and he concluded that the causative factor, in
most cases at least, was to be found in a softened condition of
the interarticular portion of the last lumbar vertebra, depend-
ent upon deficient ossification, which, under the influence of
the body weight, permitted an elongation of that portion of
the vertebra and the subsequent development of spondylolis-
thesis.

From this brief summary, it is apparent that there was no
unanimity among the authors concerning the etiology of the
affection, and that practically the number of theories advanced
to explain its production was limited only by the number of
authors who wrote upon the subject. Thus, we find that the
deformity was variously believed to depend upon a softening
of the intervertebral cartilages or the surrounding ligaments,
hydrorrhachis of the lumbar region, the development of an
accessory sixth lumbar vertebra, luxation of the inferior artic-
ular processes of the fifth lumbar vertebra, fracture of the
articular processes of the last lumbar or first sacral vertebra,
rapid increase in the body weight, and, finally, lengthening
and thinning of the interarticular portion of the fifth lumbar,
as the result of faulty ossification or fracture.

These theories were thoroughly sifted and criticised by
Neugebauer in his monograph "Zur Entwickelungsgeschichte
des spondylolisthetischen Beckens und seiner Diagnose," which
appeared in 1882, and in which he collected everything which
was then known concerning the deformity. At that time, he
was able to collect from all sources 26 cases of spondylolis-
thesis, 15 of which were anatomical specimens and 11 clinical
observations.

After personal examination of many of the anatomical
specimens and careful study of the descriptions of the pelves,
which he had not seen, he stated that in no instance was the
fifth lumbar vertebra dislocated forward *in toto*, but that the
deformity was due to a lengthening of the vertebra in its in-
terarticular portion, by which its body was enabled to slip
forward over the promontory of the sacrum, while its inferior
articular processes retained their normal relation with the
upper articular processes of the sacrum.

He attributed the change in shape of the vertebra to the
action of the body weight upon an interarticular portion,
which in most cases was weakened by a solution of continuity
(spondylolysis), which was either of congenital or fractural

origin, and believed that the latter was more frequent, as there was a history of traumatism in at least fifteen of the cases. He accordingly defined spondylolisthesis as "a deformity which is produced in extrauterine life by the action of the body weight under certain predisposing conditions."

Neugebauer's work upon the subject did not stop with the publication of his monograph, as he practically devoted years of his life to its study, and, in the eleven years following its appearance, published fifteen journal articles and three monographs upon the subject which altogether covered 898 pages, not to speak of various demonstrations and discussions before medical societies.

During this period, he examined personally the great majority of the anatomical specimens and clinical cases in Europe, and his increased experience naturally led to a modification of some of his original views; so that, in an article which appeared in 1885 upon the etiology of spondylolisthesis, he stated that in the great majority of cases the changes in the interarticular portion were of congenital rather than fractural origin, as he had at first believed. This, however, did not necessarily imply that traumatism played no part in the production of the deformity, as it might readily cause a tearing apart of the syndesmosis in the interarticular portion, and so permit the body of the last lumbar vertebra to begin to slide forward.

He likewise modified his original conception by stating that in one case, at least (Strasser), there were no changes in the interarticular portion, but that the deformity was due to a forward displacement of the entire vertebra, which was rendered possible by the fracture of the superior articular process of the sacrum.

In 1892, he published a French monograph upon the subject, in which he gave a short résumé of his previous work and a complete bibliography of the subject, which showed that 100 cases had been more or less accurately observed up to that time.

In 1884 and 1885 Arbuthnot Lane, of London, wrote several very interesting articles upon the subject, in which he stated that spondylolisthesis was not so rare a deformity as was usually supposed, but that he had observed it quite frequently in the skeletons of men who had spent their lives as coal heavers.

He attributed the deformity, not to a congenital spondylolysis, but simply to a flattening of the interarticular portion of the last lumbar vertebra, by the pressure exerted upon it by the

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lower articular processes by the vertebra just above it, as the result of excessive weight transmitted through the vertebral column; and he believed that the examination of the skeletons of hard-working men would show that the deformity in question was far from infrequent.

In 1892, Chiari published a most excellent article upon the etiology of spondylolisthesis, in which he collected in a comparatively small space all that was worth knowing upon the subject. He admitted the great services of Neugebauer in the study of this affection, but believed that he had probably taken an extreme position in attempting to demonstrate a single etiological factor for all cases; as he considered that a number of factors might lead to its production, and that spondylolisthesis was not only due to a sliding forward of the body of the last lumbar, but also that the entire vertebra might be displaced forward in rare cases.

He accordingly divided the possible causes of spondylolisthesis into two categories, according as the entire vertebra or only its anterior half was displaced forward, as follows:

First category: Abnormal conditions in the lumbo-sacral articular processes, which may permit the entire last lumbar vertebra to slide forward: (1) Abnormalities in development. (2) Destruction by disease. (3) Fracture. (4) Luxation.

Second category: Abnormal conditions by which the body weight acting upon the last lumbar vertebra may lead to its elongation, so that its anterior portion can slide forward: (1) Abnormalities in the development of the arch of the last lumbar vertebra. (2) Pathological softening or destruction of the same. (3) Fracture of the same. (4) Changes in shape of the normal last lumbar vertebra resulting from excessive action of the body weight, as transmitted through the vertebral column.

He stated that only two of the possibilities mentioned in the first category have as yet been observed, namely, abnormalities in development and fracture; while in the second category the only possibility which has not been conclusively demonstrated is the primary pathological softening or destruction by disease of the interarticular portion of the last lumbar vertebra.

This has never been demonstrated in rachitis or osteomalacia and is out of the question in caries. For while it is perfectly possible for this portion of the vertebra to be destroyed in tuberculous affections, it is hardly probable that it could

result in a lengthening of the vertebra; as the patient would be confined to bed during the acute stage of the disease, when the elongation might theoretically occur, and would not be able to sit up, so that the body weight might produce the deformity, until ankylosis had taken place, which would effectively prevent the production of the deformity.

Chiari concludes his article with the description of four pelves, which substantiate the correctness of his conclusions. In the first and fourth pelves there was a displacement of the entire last lumbar vertebra; the first case being due to abnormalities in the development of the lumbo-sacral articular processes, while in the last case the etiological factor could not be definitely ascertained. In the other two cases, only the anterior half of the vertebra was displaced forward; and in each the predisposing cause was found in a spondylolysis, which in one case was present only on one side.

We would refer those who are especially interested in the history of spondylolisthesis to the articles of Lambl, Neugebauer, Chiari, and Buchheister.

Etiology.—From this short résumé of the literature, it is apparent that in the vast majority of cases the deformity is produced by the forward displacement of the anterior half of the fifth lumbar vertebra, while its posterior portion retains its normal relation, at the lumbo-sacral articulation. In a few cases, however, the entire vertebra may be displaced forward.

In the first class of cases there is no doubt that the etiological factor is usually found in a uni- or bilateral spondylolysis. This condition has been conclusively demonstrated in a number of specimens of spondylolisthesis; and Neugebauer, in his monoograph of 1892, states that he has observed it in 240 vertebræ, which were otherwise normal, and also adds that he discovered this abnormality in the last lumbar vertebra of an apparently normal skeleton in Farabeuf's study in Paris. In view of the frequency with which spondylolysis is observed, it appears strange that more cases of spondylolisthesis have not been noted.

In a certain number of specimens, the lengthening of the vertebra is simply due to a separation between the two ends of the interarticular portion, the space between them being filled by a mass of fibrous tissue, probably syndesmotic in character. This condition was beautifully illustrated in the case of the Hottentot Venus, which Lambl described, and also in two other cases, described by Krukenberg and Chiari. In each of these

specimens, there was a separation of at least one centimetre between the ends of the interarticular processes, and, on removing the tissue between them, they could be placed in apposition, when the vertebra would resume its normal appearance. In such cases, the olisthesis (slipping forward) is clearly due to a stretching of the fibrous union between the ends of the interarticular portion.

In other specimens, a distinct fissure may be noted in the thinned-out and lengthened interarticular portion, whose ends are held in close apposition by a thin layer of fibrous tissue; and it is often impossible to determine whether this condition is due to a congenital spondylolysis or to a secondary fracture of an abnormal interarticular portion.

In a few cases in which no fissure is apparent, the condition can be readily explained by supposing that a fracture of the interarticular portion had occurred at some time, and that the callus which united the ends of the bones had undergone stretching under the influence of the body weight.

In a small number of cases, however, the deformity can be explained neither by the supposition of a congenital spondylolysis nor of a fracture; and under such circumstances the theory of Lane would appear to afford the most satisfactory explanation for its production.

Thus far only 3 cases have been described in which it was satisfactorily demonstrated that the entire vertebra has been displaced forward—namely, the cases of Strasser, Meyer, and Chiari; and in all of them the deformity was due either to a fracture or some abnormality about the articular processes.

The mere existence of the anatomical predisposing cause does not lead to the production of spondylolisthesis, unless there is added to it some abnormality in the transmission of the body weight through the vertebral column. For Neugebauer has pointed out that it is frequently present, and may persist through life, without producing the slightest suspicion of deformity; or, as Chiari puts it, " the etiological factor gives rise only to a disposition to the affection, which, according to our experience, does not always eventuate in an olisthesis."

One of the interesting features in connection with the deformity is that it occurs far more often in women than in men, and indeed for a long time was considered a deformity peculiar to the female sex. As we shall see when we come to consider the frequency of the affection, only six and a half per cent of

the cases thus far described have been observed in men, and many theories have been advanced to explain this fact.

In a few instances, the first indication of the deformity was noted in early childhood, as in the cases of Breslau, Firnig, Von Herff, and Jellinghaus; but in the vast majority of cases it appears about the age of puberty, but more especially in women who have had several children. So that Olshausen suggested that the circulatory changes incident to menstruation and pregnancy may possibly produce certain changes in the structure of the bones which render them less resistant. The vast majority of the cases have been observed in women who perform hard manual labor, often in the fields; and it has therefore been suggested that the appearance of the deformity about the time of puberty is due to the fact that girls usually begin to work hard about that time.

Both of these explanations would seem to apply equally well to both sexes, while the affection occurs far more frequently among women. Von Herff has attempted to explain this apparent contradiction by stating that the sedentary life, which is led by young girls, manifests itself in a faulty development of their dorsal muscles, so that, when they suddenly begin to do hard work, the vertebral column does not receive the same support as in boys, who have been accustomed to active exercise since childhood.

Returning once more to the consideration of our specimen, we find that its most characteristic feature is the marked lengthening and flattening of the interarticular portion of the last lumbar vertebra, so that its upper and lower articular processes, instead of being in the same vertical line, are two centimetres apart.

We also find that each interarticular portion is divided by three fissures into three pieces, and is perforated by an oval opening through which passes the lower articular process of the fourth lumbar. The portions of bone composing the interarticular portions are held in close apposition by a slight amount of fibrous tissue. The fissures between them, however, are not all of the same character; for the margins of the fissure on the outer side of the right interarticular portion and the anterior fissure on the outer side of the left interarticular portion (Fig. 6) are somewhat thicker than the adjoining portions of bone, and present a markedly nodulated appearance as if for the attachment of a joint surface; while the margins

of the other four fissures are not thickened and present an irregularly fractured appearance.

In considering the etiology of our specimen, we must, therefore, study the nature of these fissures and ascertain, if possible, whether they were concerned in the production of the elongation of the interarticular portion. A glance at Figs. 5 and 6 clearly shows that the deformity is not due to a mere stretching of the fibrous tissue between the ends of a spondylolytic vertebra, as the margins of all the fissures in our specimen are in close apposition. And it is extremely difficult to reach a satisfactory conclusion as to the nature of the various fissures; but we are inclined to believe that the two which have nodular margins (Fig. 6) are due to deficient ossification and therefore represent a congenital spondylolysis, while we are unable to express a positive opinion concerning the nature of the other four. Their sharp, jagged margins are very suggestive of recent fracture, but the absence of callus and the presence of fibrous tissue between them speaks against this view.

The mode of origin of the oval openings in the interarticular portions is, likewise, not perfectly clear, and it is impossible to state positively whether they are congenital in origin and are part of a spondylolysis, or are the result of pressure exerted upon an imperfectly ossified interarticular portion by the lower articular processes of the fourth lumbar vertebra. We incline somewhat to the latter view, as the horizontal furrow upon the lower portion of the inferior articular process of the fourth lumbar vertebra (Fig. 5) clearly indicates that the corresponding portion of the fifth lumbar vertebra was subjected to abnormal pressure.

As the conception of a congenital spondylolysis, without separation of the ends of the vertebra, does not appear to afford a satisfactory explanation for the elongation of the interarticular portions in our specimen, and as there is nothing about it to indicate that it is due to the stretching of callus after fracture of this part of the vertebra, we are inclined to follow the example of Arbuthnot Lane and attribute at least a part of the deformity to the transmission of abnormal pressure through the vertebral column. And we believe that the change in the shape of the vertebra, which permitted the forward displacement of its body, is the result of abnormal pressure exerted upon an imperfectly ossified interarticular portion (spondylolysis) by the lower articular processes of the fourth lumbar vertebra.

This supposition is strengthened by the fact that our patient was in the habit of carrying heavy loads, and also by Lane having observed an almost identical condition in the last lumbar vertebra in one of his cases, in which he attributed the deformity to abnormal pressure and considered that he could definitely eliminate its congenital origin.

From the history of our case, it appears that the deformity had become more marked during the last four years of the patient's life. As her first labor had terminated spontaneously; while at the autopsy, four years later, the pelvis was found to be so contracted as to render spontaneous labor impossible, the increased deformity was manifestly due to still further elongation of the interarticular portion; and as the fragments of the latter still remained in apposition, the change in shape could not be directly attributed to the presence of the spondylolysis, and we are, therefore, compelled to seek its cause in continued and abnormal pressure.

The destruction of the lower part of the body of the last lumbar vertebra and the upper part of the sacrum appears to be simply the result of abnormal pressure, which is also indicated by the eburnated condition of the bone. And the synostoses between the articulations of the last lumbar with the vertebræ above and below it, must likewise be attributed to the same cause. Nowhere in the pelvis can we find any other signs of disease, and we believe that we can positively eliminate tuberculosis as a cause of the destruction of the body of the last lumbar vertebra.

The other changes in the pelvis, notably the obliteration of its inclination and its marked funnel shape, are readily explained; the former being brought about by the patient maintaining the erect position, while the latter was due to marked tension of the ilio-femoral ligaments and the retropulsion of the base of the sacrum.

Turning now to the consideration of the frequency of the deformity, we find that increased interest in the subject has brought many new cases to light. Neugebauer, in his original monograph in 1882, collected 26 cases from all sources; but in the next ten years the number had so increased that he was able to find 100 cases, 47 of which were clinical observations, while the balance were anatomical preparations. In 42 of the latter, the last lumbar vertebra was the part affected, in 10 the fourth lumbar, and in 1 the first sacral vertebra. Five of these cases occurred in men and the rest in women.

In the following year (1893), he was able to collect 15 more cases, 8 of which were clinical observations and 2 of which occurred in men. Neugebauer, therefore, has collected from the literature 115 cases of the deformity, 7 of which were in men (6 per cent).

Since the appearance of Neugebauer's work I have been able to collect 8 other cases from the literature, 1 of which was in a man, thus making a total of 123 cases, 6½ per cent of which were in males.

With the exception of the specimen described by Jellinghaus and later by Wedekind, all the other cases were observed clinically and were described by R. von Braun, Bar and Keim, Lovett, Flint, Ludwig and Savor, and Vedeler. All of these cases were more or less carefully described, except those of Flint and Ludwig and Savor, which were merely mentioned in their statistics upon contracted pelves. As none of the cases, however, presented any particularly new features, we shall not consider them in detail.

On looking over the total number of cases which have been reported, we find that 5 occurred in this country—namely, those of Blake, Lombard, Flint, Gibney, and Lovett. The last two cases occurred in men, and in both the diagnosis appears quite doubtful; as in neither of them was the displaced body of the last lumbar felt by rectal examination, the diagnosis having been based upon a certain amount of lumbar lordosis following traumatism.

The cases of Blake and Lombard, however, were apparently well-marked examples of spondylolisthesis, though the description of each leaves a good deal to be desired. Flint's case is simply mentioned in his statistics, without an attempt at description, so that we are unable to make any statements concerning it.

So far as we can learn from the literature, the present case appears to be the only one which has thus far come to autopsy in this country, and accordingly is the only specimen which has been described in detail, and we regret extremely that we are unable to express more positive opinions concerning its etiology.

It is quite likely that many such cases have escaped observation, or have not been reported, as Dr. Arthur Dean Bevan, of Chicago, informed me some months ago that he had observed the deformity several times in the dissecting room.

When we come to consider the treatment which was pursued in our case, we are perfectly free to confess that symphyseot-

omy was an ill-chosen operation and that a Cesarean section would probably have given much better results. We were led to the operation, however, by the persistent refusal of the patient to consent to a Cesarean section, and also by the fact that her previous labor had been spontaneous. In view, however, of the marked deformity of the pelvis (6.5 centimetres), the operation was clearly contraindicated and, like the only other operation of its kind (Morisani), performed for this deformity, ended fatally.

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THE HISTORY OF THE EARLY OPERATIONS FOR FIBROID TUMORS.[1]

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THE history of operations for fibroid tumors of the uterus has been discussed by many writers. Some two years ago, in looking up the literature on the subject when I was preparing

[1] Read before the American Gynecological Society, May 23, 1899.

a paper upon hysteromyomectomy, I became interested in the general subject, and, together with Dr. W. Wayne Babcock, Jr., have made a careful study of all the reported cases of the abdominal operations upon fibroid tumors of the uterus up to and including 1863. This subject, like all historical subjects, is of great interest when carefully studied. I have thought that a carefully prepared summary of the subject would be of interest to the Fellows of the Society, and of value to any one interested in the history of gynecology.

In the beginning the abdominal operations for fibroid tumors were all done through errors in diagnosis and were not intentional. These operations are undoubtedly to be credited to McDowell, because of his discovery and introduction of the operation of ovariotomy. The early operations are what are usually called exploratory operations, but which might be more properly termed abandoned operations. The usual rule in operating was that when the abdomen was opened with a diagnosis of an ovarian tumor, and the surgeon found instead a fibroid tumor of the uterus, the operation was abandoned because of the belief that such tumors were inoperable. Apparently the first surgeon who had the courage to remove a fibroid tumor by abdominal hysterectomy was Charles Clay, of Manchester, in 1843.[1] The operation was undertaken with a diagnosis of ovarian tumor, but when this was proved to be erroneous, Clay proceeded to do a supravaginal hysteromyomectomy. This patient died of hemorrhage. Clay had made a similar mistake in diagnosis in 1842, abandoning the operation when the fibroid tumor was discovered. The first patient died on the sixth day. In 1844 Clay again operated with a diagnosis of ovarian tumor, and proceeded to do a total extirpation of the uterus. This patient died on the fifteenth day, the death being attributed to a fall, the patient having been dropped in removing her from her bed. She died of peritonitis. It is thus evident that Clay was the first surgeon to do the total hysteromyomectomy for fibroid tumors of the uterus. These three operations were all fatal. It was not until January 2, 1863, that Clay did his first successful operation for fibroid tumor, performing a supravaginal amputation of the uterus.[2] Thus Clay was the first surgeon to perform hysteromyomec-

[1] Charles Clay: '' Observations on Ovariotomy, Statistical and Practical. Also a Successful Case of Entire Removal of the Uterus and Appendages.'' Transactions Obstetrical Society of London, vol. v., 1863, p. 58.

[2] Loc. cit.

tomy, and the first English or European surgeon to perform a successful hysteromyomectomy for fibroid tumor.

The first English myomectomy appears to be that of Eddison in 1854,[1] which had a favorable issue. Continental surgeons were very slow in adopting operations for fibroid tumors. Boinet appears to have been the first to operate for a fibroid tumor, in 1858.[2] He performed a supravaginal hysteromyomectomy, with a fatal issue.[3]

Koeberlé was the first Continental surgeon to perform a successful hysteromyomectomy, which he did in 1863.[4]

It is to America that we must turn for the early work in operation for fibroid tumors. W. L. Atlee performed the first successful myomectomy in 1844.[5] In 1846 John Bellinger appears to have performed the first deliberate hysteromyomectomy for a fibroid tumor of the uterus. This operation is seldom referred to in the various papers devoted to the history of hysteromyomectomy, and therefore I give a full abstract of it:

"OPERATIONS FOR THE REMOVAL OF ABDOMINAL TUMORS," BY JOHN BELLINGER, M.D.[6]

MESSRS. EDITORS:—In compliance with your request I furnish you with notes of four operations for the removal of abdominal tumors. Other engagements of a pressing nature compel me to confine myself to a brief account of the cases. I will, however, remark that, notwithstanding the objections that have been plainly and forcibly urged against this operation, the sentiment of the profession is becoming every year more favorable to its performance, and that a woman need not be gifted with unnatural capacity of endurance in order to "*escape*" its dangers.

CASE I.—Extirpation of an ovarian tumor complicated with hydrops uteri; recovery.

CASE II.—Ovarian tumors; explorative incision; operation desisted from; recovery.

CASE III.—Scirrhous tumor of pelvic origin; removal; recovery.

[1] John Sloane, M D., Nottingham General Hospital: "Gastrotomy: Removal of Fibrous Tumors of the Uterus: Death." British Medical Journal, London, Saturday, February 27, 1858, No. lxi., new series, p. 159.

[2] A. A. Boinet: Gaz. hebd. Méd. et Chir., No. 8, 1873.

[3] A. A. Boinet: Traité prat. des Malad. des Ovaires, 1867, p. 420.

[4] "Documents pour servir à l'Histoire de l'Extirpation des Tumeurs fibreuses de la Matrice par la Méthode sus-pubienne." Gaz. méd. de Strassburg. No. 2, 1864 p. 17.

[5] American Journal of Medical Sciences, April, 1846.

[6] Southern Journal of Medicine and Pharmacy, May, 1847, vol. xi., No. 3, p. 241.

Case IV.—Uterine tumor; removal; death.

The subject of this case was a black woman about 30 or 35 years of age The tumor, apparently a diseased uterus, had been detected several years before when just rising above the brim of the pelvis. It now occupied the lower region of the abdomen, like a uterus at the fifth month of gestation. It was movable under pressure or change of position. The patient's health had failed considerably under the continual pains that she suffered, and copious discharges that flowed from the vagina, sometimes of a menstrual, at others of a hemorrhagic character. She consented to the operation, the dangers of which were distinctly explained to her, at the same time that she was encouraged to hope that it would be successful. Assisted by Drs. Geddings, Ogier, and Pelzer, I operated in June, 1846, extirpating a large, irregular tumor that involved the uterus; in fact, is the uterus itself. The operation was commenced by making an incision through the integuments, extending from an inch above the umbilicus to the pubes. The tendons of the flat abdominal muscles were divided in the linea alba, and the peritoneum laid open. The tumor was found free of morbid adhesions, but too large to be removed through so narrow an opening as the first incision afforded; and a second (about three inches in length) was made, at right angles with its upper extremity, directed toward the left iliac region. This enabled me to elevate the tumor and divide the lateral ligaments. They were very vascular, and many arteries (the number not distinctly remembered) required tying. Animal ligatures were applied to all of them. The neck of the uterus was cut across about three-quarters of an inch above the os tincæ, and the entire tumor removed. The wound was closed by sutures, plasters, and bandage. Symptoms of peritonitis soon appeared; the inflammation progressed in spite of medical treatment, and proved fatal on the fifth day. Autopsy disclosed signs of diffused peritoneal inflammation, with effusion of bloody serum. There had been no internal hemorrhage. The remnant of the uterus was removed and placed with the tumor in the museum of the Medical College.

Bellinger's operation was clearly a hysterectomy for a fibroid tumor of the uterus, and it is equally evident that his operation was undertaken deliberately with the recognition that the tumor was of uterine origin. With our present light upon fibroid tumors, his diagnosis that the tumor was apparently a diseased uterus would be very defective, but in the light of the pathology of 1846 this was much less true. Bellinger was evidently an operator of experience, who maintained a favorable attitude toward abdominal surgery. It is quite evident that he looked upon hysterectomy as falling within the same principles that applied to ovariotomy. Unfortunately his patient died, and, so far as can be learned, he did not operate

again nor further advocate the surgical treatment of fibroid tumors; nevertheless his name should have a place in the history of hysterectomy. It is probably correct to consider that he was the first surgeon deliberately to perform hysterectomy. His merit is lessened by the fact that his diagnosis was not a perfect one and that the operation was unsuccessful.

Following Bellinger's operation there come a number done under a false diagnosis and leading to no practical results, until 1853, when Burnham performed his first hysteromyomectomy with a successful issue. This operation is one of such importance from the historical standpoint that it deserves careful consideration. It is quite evident, when one reads the several accounts of this operation by Burnham himself, by Perkins, and by Irish, that the operation was not a deliberate one, but undertaken with a diagnosis of ovarian tumor. It also appears that, after the abdominal incision was made, the patient vomited and extruded the tumor, which could not be replaced within the abdomen, and that, therefore, Burnham was driven to remove the tumor. He is thus to be credited with successfully accomplishing what no one else had ever done, but not with the conception of the deliberate performance of hysteromyomectomy. Bellinger seems to have been the first to have conceived this operation and to have carried it out with a fatal issue. Burnham was driven to the performance of it and did so with a successful result. The following rather full abstract indicates Burnham's position:

EXTIRPATION OF THE UTERUS AND OVARIES FOR SARCOMATOUS DISEASE.

By WALTER BURNHAM, M.D., of Lowell, Mass., and Professor of Surgery in the Worcester Medical College.

This article is a description of Burnham's first hysteromyomectomy, referred to on page 2 of my paper, "The Development and Present Status of Hysteromyomectomy for Fibromata."[1]

The title of the paper indicates how hazy Burnham's ideas were on the subject of the nature of the growth removed. Burnham's original description of the operation differs from that given by Irish on the point that the hysteromyomectomy became necessary because of the extrusion of the tumor from vomiting.

[1] Transactions of American Gynecological Society, 1897, vol. xxii.

Burnham evidently had no idea, when the case was reported, of advocating hysterectomy for fibroid tumors, as his paper treats of the subject from the standpoint of ovariotomy, and reference is made to his other operations of ovariotomy. The following quotation indicates his attitude:

" This is the fourth operation I have performed within the last two years for the removal of ovarian tumors, all successful but one, which proved fatal on the third day after the operation. The first tumor weighed 12 pounds, the second over 50 (unsuccessful), the third 24 pounds, and the fourth—the subject of this communication—8 pounds; yet this one from its complications proved much the more difficult, although it was the smallest of the four. Although this case terminated favorably, I would not easily be induced to make another attempt to extirpate the uterus and ovaries or even to remove the uterus under almost any condition; and the operation should never be attempted without due consideration of the consequences of submitting a patient to such formidable risk." [1]

This report by Burnham himself makes it clear that whatever credit he deserves (and this is great) as one of the pioneers in hysterectomy cannot be based upon his performance of this original operation. His position as one of the pioneers in the development of hysterectomy must rest rather upon the fact that he continued to perform the operation for many years, from time to time, performing altogether fifteen operations. His success was not great, as he had but three recoveries.

The paper by Irish [2] gives the best account of Burnham's work. The paper by Perkins [3] may also be consulted.

G. Kimball, of Lowell, Mass., was the first deliberately to perform hysterectomy for fibroid tumor with a successful result. This operation was done September 1, 1853. [4] Kimball is to be credited not only with the conception of the operation, but with its successful performance. His merit is greater

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[1] Nelson's American Lancet, vol. viii., October, 1853, to March, 1854, p. 147.

[2] John C. Irish: "Hysterectomy for the Treatment of Fibroid Tumors." Transactions of American Medical Association, 1878, p. 447.

[3] Henry P. Perkins: " Three Hundred and Thirty-eight Cases of Abdominal Section in the Practice of Dr. Walter Burnham, Lowell, Mass., etc." Annals of Gynecology and Pediatrics, May, 1888.

[4] G. Kimball: First " Successful Case of Extirpation of the Uterus " for Fibromyoma. Boston Medical and Surgical Journal, May 3, 1855, p. 249. G. Kimball: " Extirpation of the Uterus." Transactions of American Medical Association, 1877.

than that of Bellinger because his conception of the nature of the disease is more definite, and he successfully performed the operation and advocated its performance in a formal paper. It was greater than that of Burnham because the operation was done deliberately instead of from compulsion, and because he advocated the operation upon rational grounds instead of failing to recognize its real nature and deprecating it, as was done by Burnham.

Kimball's original paper leaves it doubtful whether it was his first or second hysterectomy which was successful. There are three cases reported in this paper, and this point is open to question. One recovered and the other two died. Kimball operated a fourth time in 1855, also with a fatal result, making four operations with one recovery during the period covered by these investigations. During the same time Burnham performed five operations with one recovery.

In 1853 Washington L. Atlee [1] published his essay upon the surgical treatment of fibroid tumors, hitherto considered beyond the resources of art, and strongly advocated operation for fibroid tumors, but his successes were largely obtained by attacking the tumors by the vaginal route. He operated by the abdominal route, removing pedunculated and sessile tumors, and was the first to do a myomectomy for a sessile tumor. [2] But the results secured by Atlee in his abdominal work were not such as to encourage followers.

This, then, was the status of abdominal operations for fibroid tumors of the uterus when, in 1864, Koeberlé published his historical paper upon hysterectomy and introduced his well-known method of securing the pedicle with the serre-neud. [3]

This paper is one of the landmarks in the history of hysterectomy, because it forced upon the attention of European surgeons the work which had been done in America and England, and in this way powerfully stimulated the progress of hysterectomy. This is the real merit of the paper, which is an excellent résumé of all that was known upon the subject at that time. A careful study of the paper shows that human nature was not different at that time from the present. For example, it is interesting to see how he makes it out that he himself was the first to have done a deliberate hysterectomy.

[1] Washington L. Atlee: Prize essay, "The Surgical Treatment of Certain Fibrous Tumors of the Uterus, etc." Transactions of American Medical Association, 1853, p. 559.   [2] Loc. cit., p. 548.   [3] Loc. cit.

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AMERICAN TABLE.

No.	Date	a. Operator. b. Reporter.	Age. M. S. W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure
1	Before 1831.	a. Nathan Smith. b. Nathan R. Smith.	......	Probably ovarian	Abandoned.	Exploratory incision..
2	Aug. 28, 1844.	a. W. L. Atlee. b. W. L. Atlee.	24, S.	Ovarian. Had been previously tapped.	Completed.	Incision eight inches long. Pedicle transfixed and tied. Tumor removed. Ligatures brought out at the lower angle of the wound.
3	1844.	a. J. L. Atlee. b. W. L. Atlee.	42	......	Probably completed; not definitely stated	Major incision. Hemorrhage from the slipping of ligatures.
4	June, 1846.	a. John Bellinger. b. John Bellinger.	30–35. Colored.	Uterine disease.	Completed.	One long incision, with a second at right angles to it. Supravaginal hysterectomy. Animal ligatures used to tie many arteries.
5	Jan. 8, 1848.	a. Samuel Parkman. b. Samuel Parkman.	27, S.	Ovarian, but not positive. Previous ineffectual tapping.	··	Complete removal of tumor and upper part of uterus. Uterus transfixed and tied with waxed silk. Ligatures brought out through the wound. Ovaries not removed.
6	June 6, 1848.	a. J. Deane. b. John Deane.	43, M.	Ovarian, but was not sure that it was not a uterine tumor.	Incomplete.	Incision from the left of umbilicus to pubis. Operation abandoned. Intestines troublesome.

AMERICAN TABLE.

Description of tumor.	Result.	Bibliography.
Tumor constituting a large part of the uterus.	Not stated	(Ref. 1) Medical and Surgical Memoirs of Nathan Smith. Edited, with addenda, by Nathan R. Smith. Baltimore, 1831, p. 231.
Nodular. pediculated, non-adherent fibroid tumor weighing 1 pound 13 ounces. Supposed to be ovarian, but the ovaries were found to be normal at the autopsy.	Recovered. Died three years later of phthisis. Autopsy.	(Ref. 2) Case of Successful Extirpation of a Fibrous Tumor of the Peritoneal Surface of the Uterus, by Washington L. Atlee, Lancaster. Pa. American Journal of the Medical Sciences, April, 1845, No. 18 (new series), Art. 3, p. 309, vol ix. (Ref. 3) Synopsis of Thirty Cases of Ovariotomy occurring in the Practice of the Author, by W. L. Atlee, Philadelphia. American Journal of the Medical Sciences, April. 1855, No. 58 (new series), vol. xxix., Art. 7, p. 387. (Ref. 4) The General and Differential Diagnosis of Ovarian Tumors. etc., by Washington L. Atlee. Philadelphia, 1873, p. 249, Case 70. J. B. Lippincott & Co.
Four uterine tumors with thick, vascular pedicles and extensive adhesions.	Died on fifth day.	(Ref. 5) A Table of all the Known Operations of Ovariotomy from 1701 to 1851, comprising 222 Cases, including their Synoptical History and Analysis, by Washington L. Atlee, M.D. (Extracted from the Transactions of the American Medical Association, 1851, p. 286.) Philadelphia, 1851, p. 8, Case 76.
Interstitial uterine tumor the size of a uterus at the fifth month of gestation.	Died fifth day; peritonitis. Autopsy.	(Ref. 6) John Bellinger, M.D. Art. 1: Operations for Removal of Abdominal Tumors. Southern Journal of Medicine and Pharmacy, vol. ii., No. 3, p. 244, 1847, Charleston, S. C.
Very soft interstitial uterine fibroid weighing 8 pounds 13 ounces, and showing degenerative softening in the centre.	Died eleven to twelve hours. after operation, from hemorrhage.	(Ref. 7) Samuel Parkman, M.D.: Extirpation of a Peculiar Form of Uterine Tumor simulating Ovarian Disease, by the Large Peritoneal Section, followed by an Unsuccessful Result. American Journal of the Medical Sciences, Art. 9, p. 371, No. 30 (new series), April, 1848, vol. xv.
A large fibroid tumor involving the left half of the uterus and broad ligament. Right ovary normal: the left was not seen.	Recovered. Inflammation.	(Ref. 8) Fibrous Tumor of the Uterus; Gastrotomy, by J. Deane. Communication to the Boston Medical and Surgical Journal, vol. xxxix., 1849, p. 221.

No.	Date	a. Operator. b. Reporter.	Age. M.S.W.	Preliminary diagnosis	Completed or incomplete.	Operative procedure.
7	May 22, 1849.	a. W. L. Atlee. b. W. L. Atlee.	33, S.	Obscure. Supposed to be a pediculated uterine or a fibrous ovarian tumor. Tapped two months before operation. Only a teaspoonful of blood flowed.	Abandoned.	Incision from four inches above umbilicus to pubis. Nothing was removed.
8	Oct. 13, 1849.	"	43, S.	....	Incomplete.	Incision from one inch above umbilicus to pubis. Operation abandoned.
9	Nov. 24, 1849.	"	39, M	" Doubtful." Extrauterine tumor Ovarian or uterine.	Completed.	Incision from one inch above umbilicus to pubis. Tumor removed.
10	Dec. 29, 1849.	a. H. J. Bigelow. b. H. J. Bigelow.	22	?	"	Incision from umbilicus to pubis. Fibroid tumor removed by ligature around its pedicle. Tumor of ovary removed. Adhesions divided. Had been previously tapped twice.

Description of tumor.	Result.	Bibliography.
A large, non-adhe-rent, interstitial, degenerated fibroid tumor of the uterus, with subperitoneal cysts and diseased ovaries. the left ovary having the size of an orange, and the right ova ry having three times its normal bulk.	Recovered, dying six months later from erysipelas after inci-sion into the neck of the uterus and the use of ergot.	(Ref. 9) Cases 4 and 5 of Large Perito-neal Section (this is Case 4), by Washington L. Atlee. American Journal of the Medical Sciences, vol. xix., 1850, No. 38 (new series), April, Art. 3, p. 318. Synopsis of Thirty Cases of Ovarioto-my occurring in the Practice of the Author, by Washington L. Atlee, p. 388. Case 4. See Ref 3. The Diagnosis of Ovarian Tumors, by W. L. Atlee, p. 243, Case 69. See Ref. 4. (Ref. 10) Prize essay: The Surgical Treatment of Certain Fibrous tu-mors of the Uterus heretofore con-sidered beyond the Resources of Art, by Washington L. Atlee, M.D., Philadelphia. (Pamphlet from the Transactions of the American Medi-cal Association for 1853.) Philadel-phia, 1853, Case 4, p. 42. (Ref. 11) The History and Statistics of Ovariotomy, by George H. Lyman, p. 38, Case 8, Boston, 1856. A Table of all the Known Operations of Ovariotomy, by Washington L. Atlee, M.D. Philadelphia, 1851, p. 22, No. 197. See Ref. 5.
Non-adherent fibro-cystic tumor in-volving the ute-rus. Died three or four years later, the mass then weigh-ing 50 pounds.	Recovered....	Synopsis of Thirty Cases of Ovarioto-my occurring in the Practice of the Author, by W. L. Atlee, p. 388, Case 6. See Ref. 3.
A pediculated, non-adherent fibroid tumor at-tached to the an-terior face of the uterus, weighing 6 pounds The ovaries were normal.	Recovered, dying thir-ty-nine days later from cholera morbus.	Synopsis of Thirty Cases of Ovarioto-my occurring in the Practice of the Author, by W. L Atlee, p 388, Case 7. See Ref. 3. Diagnosis of Ovarian Tumors, by Washington L Atlee, M.D., Case 71, p. 251. See Ref. 4.
Ascites; pediculated fibroid tumor of the uterus weigh-ing ¾ pound. Cyst of left ovary, weight 8 pounds. Adhesions.	Death third day.	(Ref. 12) H. J. Bigelow (exhibited specimen the day it was removed): Boston Medical and Surgical Jour-nal, No. 41, January 23, 1850, p. 503. Lyman's History and Statistics of Ova-riotomy, p. 50, Case 84. See Ref. 11.

No.	Date.	a. Operator. b. Reporter.	Age. M. S. W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure
11	1849, New York.	a. Not stated. b. Dr. Bibbins.	......	Not stated.	Not stated.	Uterus removed......
12	April 13, 1850.	W. L. Atlee.	41, S. Colored.	Not given. Probably incorrect.	Incomplete.	Anesthesia. Incision from umbilicus to pubis. Intestines forced out and replaced with difficulty. Abandoned.
13	1850.	R. D. Mussey.	......	Not stated. Evidently incorrect.	"	Long incision. Operation abandoned.
14	May 20, 1851.	a. W. L. Atlee. b. W. L. Atlee.	45, M.	Correct...	Completed.	Anesthesia. Incision from two inches above umbilicus to pubis. Tumor removed. Intestines troublesome and remained out during operation.
15	June 12, 1851.	a. John B. Hayes. b. John B. Hayes.	42. Colored.	Not stated.	"	No anesthetic. Incision eight inches long. Pedicle transfixed, tied, and tumor removed. Intestines troublesome.
16	Dec. 20, 1851.	a. W. L. Atlee. b. W. L. Atlee.	42, M.	"Obscure." "Fibrous." "Probably extrauterine."	Incomplete.	Anesthesia. Incision from one inch above umbilicus to pubis. Abandoned.
17	March 3, 1853.	"	40, M.	Not stated.	Completed.	Incision from two inches above umbilicus to pubis. Tumors removed. Interstitial tumor enucleated.

Description of tumor.	Result.	Bibliography.
Account meagre....	Died on the table.	(Ref. 13) Report of the New York Pathological Society, stated meeting, November 27, 1867. Discussion by Dr. Bibbins, after the presentation of a tumor removed by Atlee. The Medical Record (New York), vol. ii., February 15, 1868, p. 571.
Uterine tumor. adhesions.	No Recovered. Health improved.	Synopsis of Thirty Cases of Ovariotomy (Case 11, p. 389), by W. L. Atlee. See Ref. 3.
Interstitial tumor of the uterus.	Died fourteen hours after operation ("Exhaustion.")	Ref. 14) Ovariotomy in Ohio; being a Report of a Special Committee of the Ohio State Medical Society, by Dr. J. W. Hamilton. The Ohio Medical and Surgical Journal, November 1, 1859, vol. xii., No. 2, Case 46, p. 113. (Ref. 15) Letter to W. L. Atlee in the Transactions of the American Medical Association, iv., 1851, p. 308.
An "extrauterine" fibroid tumor attached by pedicle to the fundus of the uterus, weighing 6 pounds Several other fibroids in the uterus, evidently not removed.	Died third day. Hemorrhage.	Synopsis of Thirty Cases of Ovariotomy (Case 16, p. 390), by W. L. Atlee. See Ref. 3. Diagnosis of Ovarian Tumors, by W. L. Atlee, p. 253, Case 72. See Ref. 4.
Lobular fibro-cartilaginous tumor attached to posterior portion of fundus by pedicle 1 inch long. Weight 3¼ pounds. Adhesions to the omentum.	Recovered....	(Ref. 16) Gastrotomy; Successful Extirpation of Fibro-cartilaginous Tumor, by John B. Hayes, M.D. American Journal of the Medical Sciences, vol. xxxiii., No. 66 (new series), April, 1857, p. 322, Art. 5.
A subperitoneal extrauterine fibroid with firm adhesions. An abdominal abscess was opened and discharged during the operation.	Recovered. secondary operation through the vagina, followed by diminution in the size of the tumor by eremacausis.	A Synopsis of Thirty Cases of Ovariotomy (Case 17, p. 390), by W. L. Atlee. See Ref. 3 Prize essay (Case 12, p. 83), by Washington L. Atlee. See Ref. 10.
Two pediculated fibroid tumors and one interstitial fibroid tumor of the uterus weighing 4 pounds.	Died on the third day from peritonitis.	Synopsis of Thirty Cases of Ovariotomy, by W. L. Atlee, p. 391, Case 21. See Ref. 3.

No.	Date	a. Operator. b. Reporter.	Age. M & W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure.
18	June 26, 1853.	a. W. Burnham. b. W. Burnham. b. J. C. Irish c. H. P. Perkins	38, S.	Left ovarian tumor.	Completed.	Incision six inches long. Tumors, uterus, and appendages forced out by the patient vomiting, and removed because they could not be replaced. (This is not mentioned in the original report.) Pedicle of fundal tumor first tied, and this tumor removed. Spermatic arteries ligated, left ovarian tumor removed, and right ovarian tumor incised. Supravaginal removal of the uterus, only the uterine arteries now requiring ligature.
19	Prior to Sept., 1853.	a. G. Kimball. b. G. Kimball.	......	Ovarian tumor.	··	Removal of the uterus and tumor.
20	Sept. 1, 1853.	"	34, M.	Uterine tumor	··	Incision four inches long. Uterus incised, tumor enucleated, and cervix then transfixed by a needle " doubly armed," when the cervix was tied in halves and a supravaginal hysterectomy performed.
21	Sept. 21, 1853	a. E. R. Peaslee b. E. R. Peaslee.	35, W.	Right ovarian tumor.	··	Incision four inches long. A trocar was thrust into the tumor, but only blood flowed. The bleeding trocar wound seems to have impelled the hysterectomy. Incision increased to six inches in length. Lower portion of the uterus transfixed with four threads of saddler's silk, tied, and the uterus and left ovary cut away. Ligatures brought outside through the wound. Gum elastic drainage tubes.

Description of tumor.	Result.	Bibliography.
The principal portion of the tumor was attached to the fundus by a pedicle one inch in diameter. The uterus filled the pelvis. The left ovary was fibrous and the size of the fist, while to the right ovary was attached a cyst containing 6 or 8 ounces of dark fluid.	Recovery......	(Ref. 17) Extirpation of the Uterus and Ovaries for Sarcomatous Disease, by Dr. Walter Burnham, Lowell. Mass. Nelson's North American Lancet, vol. viii.. January, 1854, Art. 36, p. 147. (Ref. 18) Hysterectomy for the Treatment of Fibroid Tumors, with a Report of Fifteen Cases. by John C. Irish, M.D , Boston The Transactions of the American Medical Association. vol. xxix., 1878, p. 448, Case 1 (Ref 19) Three Hundred and Thirty-eight Cases of Abdominal Section in the Practice of Dr. Walter Burnham, Lowell. Mass.. with a brief Report of his Life and Methods. by his grandson, Henry P. Perkins, Jr., M D. (Harv.), Canandaigua, N Y. The Annals of Gynecology, May, 1888, vol. i.. No 8, p. 369.
An enormous, irregular, lobulated tumor of the uterus	Died tenth day.	(Ref. 20) Successful Case of Extirpation of the Uterus, by G. Kimball, M D , Lowell, Mass. Boston Medical and Surgical Journal, vol. lii., May 3, 1855, p. 254, No 13.
An interstitial fibroid tumor of the uterus, enlarging abdomen equal to a six months' gestation. Weight not exceeding 10 pounds (Storer) shape globular. with a diameter of about 7 inches.	Recovery......	Successful Case of Extirpation of the Uterus, by G. Kimball, M.D., Lowell, Mass. The Boston Medical and Surgical Journal Thursday, May 3, 1855, vol. lii., No. 13, p. 249. See Ref. 20. (Ref. 21) Successful Removal of Uterus and Ovaries, by H. R. Storer, M.D. The American Journal of the Medical Sciences (new series), vol. li.. January, 1866, Art. 8, pp. 124 and 138.
Interstitial fibroid tumor of the uterus showing central degeneration and weighing 18 ounces avoirdupois. The left ovary was diseased.	Death on the fifth day. the intestines having been strangulated in two places by being forced through the wound.	(Ref. 22) A Case of Removal of the Entire Body of the Uterus by the Large Abdominal Section, by E. R. Peaslee. A.M., M.D. The American Journal of the Medical Sciences. No. 58 (new series), vol. xxix., April, 1855, p. 393, Art 8.

No.	Date.	a. Operator b. Reporter.	Age. M.S.W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure.
22	Oct. 12, 1853.	a. G. Kimball. b. History by Dr. Cutter, of Woburn. Exhibited by Dr. J. S. B. Jackson.	33, S.	Not stated.	Incomplete.	Incision nine inches long. The tumor was incised, but bled so freely as to require ligature. Operation abandoned.
23	Aug. 12, 1854.	a. Dr. Herff, Texas. b. Dr. J. D. B. Stillman.	43, M.	Ovarian ..	Completed.	Incision five inches long. Tumor enucleated from the uterus, and wound coaptated by four uterine sutures.
24	Aug., 1854.	a. Dr. W. Burnham. b. J. C. Irish. b. H. D. Perkins.	M.	....	"	Incision eight inches long. The broad ligaments were tied in sections, and a double ligature was passed through the cervix.
25	Sept. 30, 1854.	a. W. L. Atlee. b. W. L. Atlee.	59, M.	Not stated.	"	Incision about six inches long. Both ovaries and an independent pelvic tumor removed.
26	Between Sept., 1853, and May, 1855.	a. G. Kimball. b. G. Kimball.	......	Evidently uterine fibroma.	"	Removal of the tumor and the uterus.
27	Nov. 13, 1856.	a. William J. Baker. b. John M. Boyd.	M.	Obscure, but considered to be attached to the uterus.	"	Incision from one and a half inches above the umbilicus to the pubis. Cervix transfixed and tied and adhesions separated. Uterus, tumor, and appendages removed. Pedicle secured to the lowest point of the incision.

Description of tumor.	Result.	Bibliography.
An adherent, interstitial, multinodular uterine fibroma weighing 3½ pounds and involving both the fundus and the cervix.	Death on twelfth day.	(Ref. 23) Fibrous Tumor of the Uterus; Exploratory Gastrotomy. Specimen showed by Dr. J. S. B. Jackson. Extracts from the records of the Boston Society for Medical Improvement, in the American Journal of the Medical Sciences for April, 1854, No. 54 (new series), vol. xxvii., Art. 3, p. 341.
A hard, adherent uterine fibroid weighing 4 pounds and 3 ounces.	Recovered	(Ref. 24) Fibrous Tumor of the Uterus successfully removed by Abdominal Section, and Recovery of the Patient, by Dr. Herff, San Antonio, Texas. Reported by Dr. J. D. B. Stillman, the New York Journal of Medicine, vol. xvi., No. 2 (new series), March, 1856, p. 167, Art. 2.
Interstitial uterine fibroid tumor impacted in the pelvis. Weight 8 pounds.	Death on the fifth day from septicemia.	Hysterectomy for the Treatment of Fibroid Tumors, by John C. Irish, M.D. See Ref. 18, Case 2, p. 450. Three hundred and thirty-eight Cases of Abdominal Section, by Henry D. Perkins, M.D. See Ref. 19, p. 369.
The right ovary was hard and fibrous, with a short, thick fibrous pedicle. The left ovary was fibrocystic, and a fibrous pelvic tumor of bony hardness was found. Weight of the tumor 20 pounds. Firm and extensive adhesions.	Death on the fifth day from secondary hemorrhage.	Synopsis of Thirty Cases of Ovariotomy, by W. L. Atlee, p. 392, Case 27, 1855. See Ref. 3. Lyman (History of Ovariotomy, Ref. 11) gives date as September, 1850.
Fibroid tumor of the uterus.	Died the third day from hemorrhage due to the slipping of a ligature.	Successful Case of Extirpation of the Uterus, by G. Kimball, M.D. See Ref. 20, p. 254. Successful Removal of Uterus and Ovaries, by H. R. Storer, M.D. See Ref. 21.
An interstitial fibrous uterine tumor weighing 46 ounces avoirdupois, and adherent to the lumbar and sacral regions.	Recovered	(Ref. 25) An Operation for the Removal of a Uterine Tumor, together with the Extirpation of the Entire Organ and its Appendages, by William J. Baker. M.D., Knoxville Tenn. Reported by John M. Boyd who assisted. Addendum, Art. 9, in the American Journal of the Medical and Physical Sciences, January, 1857, vol v., p. 71.

(Ref. 26) Baker's case in the January number, on p. 220, March, 1857, of the same volume.

(Ref. 27) Reprint in the American Journal of the Medical Sciences, No. 66 (new series), April, 1857, vol. xxxiii., Domestic Summary, p. 572. *Title*. Extirpation of Uterus and its Appendages, by *Dr. John M. Boyd.* (Of course Boyd was not the operator.)

No.	Date.	a. Operator. b. Reporter.	Age. M.S.W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure.
28	June, 1857.	a. Walter Burnham b. J. C. Irish. b. H. P. Perkins Jr	...	Correct...	Evidently completed.	Operation performed as a last resort De-tails are meagre.
29	Nov., 1857.	a. Walter Burnham b. J. C. Irish.	33, S.	"	"	Supravaginal hyste-rectomy.
30	Previous to 1857.	a. Bradford and Dunlap. (Operation in Iowa.) b. J. C. Bradford.	......	"	Completed.	Details meagre. The operation was done under protest, Brad-ford considering ute-rine tumors as un-suitable for abdomi-nal section.
31	Feb., 1858.	a. Walter Burnham. b J. C. Irish. b. J. C. Bradford.	44, M.	"	Evidently completed.	Abdominal hysterec-tomy, amputating through the cervix.
32	June 8, 1859.	a. A. F. Sawyer. b. A. F. Sawyer	43, M.	At first thought to be ute-rine, but after-ward-consider-ed to be ovarian.	Completed.	Incision from a little above umbilicus to pubis. Transfixed and tied off below the cervix. Uterus and tumor removed. Ligatures brought out through the wound.
33	Previous to Nov., 1859.	a. G. C. Blackman b. J. W. Hamilton.	......	Ovarian..	Incomplete.	A short exploratory incision.
34	Previous to 1860.	a. Dr. Nelson. b. A. F. Sawyer.	......	.. ..	....	....
35	June 18, 1862.	W. L. Atlee.	40, S.	Ovarian. Tapped March 22. Oiij.	Completed.	Removal of tumor....
36	Oct. 26, 1863.	Packard....	21, S.	Ovarian..	Incomplete.	Incision four inches long. Tumor tapped, producing hemor-rhage, which was controlled by liga-tures and sutures. Wound closed.

Description of tumor.	Result.	Bibliography.
An impacted interstitial uterine fibroma weighing 6 pounds.	Death in fifty-two hours.	J. C Irish: American Journal of the Medical Sciences, p. 451, Case 3. Hysterectomy for the Treatment of Fibroid Tumors. See Ref. 18. Henry P. Perkins Jr.: Annals of Gynecology May, 1888, p. 369. Three hundred and thirty-eight Cases of Abdominal Section. See Ref. 19.
An interstitial fibroid tumor weighing 12 pounds.	Death the fourth day from "shock" and nervous exhaustion.	Same references as for last case. See Refs. 18 and 19. J. C. Irish, Case 4, p. 451.
. . . .	Death	(Ref. 28) Selections from a Report on Ovariotomy. Read before the Kentucky State Medical Society at its annual meeting at Louisville, April, 1857, by J. Taylor Bradford, M.D. Reprint. p. 54. Published in the Louisville Medical News.
A subperitoneal fibrocystic tumor involving the entire fundus and weighing 25 pounds.	Death the day after the operation from shock	Henry P. Perkins, Jr.: Three hundred and thirty-eight Cases of Abdominal Section. See Ref. 19; J. C Irish, Hysterectomy for the Treatment of Fibroid Tumors. See Ref. 18, Case 5, p. 451.
A non-adherent interstitial fibroid tumor of the fundus uteri weighing 7½ pounds.	Death on the sixth day from peritonitis, probably following secondary hemorrhage.	(Ref. 29) Carcinoma of the Uterus; Extirpation, by A. F. Sawyer. M.D., San Francisco. The American Journal of the Medical Sciences, No. 79 (new series), p. 46, vol. xl., July, 1860
A tumor of the uterus and ovaries in which some intestines were embedded.	Death a few days after the opera tion.	Ovariotomy in Ohio, by J. W. Hamilton. See Ref. 14.
Large uterine fibroid separated from its pedicle.	Recovered. . . .	Carcinoma of the Uterus, by A. F. Sawyer. See Ref. 29.
Fibrocystic, peduculated tumor of the uterus (?), with myxomatous pedicle. Solid portion weighed 40 pounds, fluid 15 pounds.	Death on the fourth day.	Diagnosis of Ovarian Tumors, by W. L. Atlee. 1873. See Ref. 3.
Fibroid tumor weighing 13 to 14 pounds, pediculated, possibly developing from the left ovary and uterus.	Death on the fifteenth day from peritonitis	(Ref. 30) Operation for Supposed Ovarian Tumor, by Dr. Packard. Summary of Transactions of College of Physicians of Philadelphia, in the American Journal of the Medical Sciences, vol. lxvii., 1871, p. 433, No. 124 (new series), October, 1871, p 433 Art. 19.

ENGLISH TABLE.

N.	Date.	a. Operator. b. Reporter.	Age.	Preliminary Diagnosis	Completed or incomplete.	Operative procedure.
1	1825, April 24.	a. John Lizars b. John Lizars. b. Dr. Myrtle. b. Dr. Taylor	34	Evidently ovarian. Diagnosis not corrected until autopsy 25 years later.	Abandoned.	Incision from sternum to pubis. Tumor punctured with trocar and scalpel, but only blood flowed. Wound stitched and held with adhesive strips.

For example, he admits the case of Burnham which was operated upon with a false diagnosis, and the two fatal cases of Kimball, but questions the successful case of Kimball and thus throws out the American cases. In the same way he eliminates the work of Clay by alleging that in Clay's successful abdominal hysterectomy, which antedated his own, the diagnosis by Clay was not entirely certain. A careful study of the cases of Koeberlé and Clay will show that both of them were somewhat doubtful about the diagnosis before operating, and that both of them undertook the operation with a determination to do whatever was best after the abdomen was opened. This makes Koeberlé the second European surgeon deliberately to undertake hysterectomy.

Those who performed hysterectomy deliberately appear to have been the following and in the order given: Bellinger, Kimball, Burnham, Clay, and Koeberlé.

It is hoped that the foregoing conclusions concerning the merits of the various early operators in the field of hysteromyomectomy may prove of interest to the Fellows.

Appended is a tabular list of all the operations.

ENGLISH TABLE.

Description of tumor.	Result.	Bibliography.
The abdominal dis tension exceeded that of nine months' gestation Tumor seemed "fibrous and cartilaginous." The omental vessels were very large. At the autopsy. twenty-five years later, the ovaries were found to be normal and the tumor, diagnosed by Simpson to be a fibroid, was found attached to the fundus by a pedicle 2 or 3 inches long. The tumor then had the size of the pregnant womb at five months.	Recovered. (Peritonitis, for which bleeding,111 ounces in 36 hours or so, and seton through anterior abdominal wall, were used.)	(Ref. 1) Observations on Extraction of Diseased Ovaria, by J. Lizars, Esq. Edinburgh, 1825, pp. 19, 20. (Ref. 2) Case of Tumor for which the Operation of Ovariotomy was attempted more than twenty-five years ago, with Dissection, by Dr. Myrtle. (Read in Dr. Myrtle's absence by Dr. Taylor.) Report of the Edinburgh Medico-Chirurgical Society, Meeting II., December 18, 1850, in the Monthly Journal of Medical Science, vol. xii., February, 1851, pp. 198–229. (Ref. 3) Case of Tumor, for which the Operation of Ovariotomy was performed more than twenty-five years ago, by John Young Myrtle, M.D., F.R C. (full article). The Monthly Journal of Medical Science (Edinburgh and London), vol. xii., 1851, March, Art. 6, p. 229. (Ref. 4) Diseases of the Ovaries, their Diagnosis and Treatment, by T. Spencer Wells. London, J. & A. Churchill, 1872, or New York, 1873, D Appleton & Co., p 184.

(Ref 5) An Analysis of 108 Cases of Ovariotomy which have occurred in Great Britain, by Robert Lee, M D., F.R.S. Read November 12, 1850. Medico-chirurgical Transactions, published by the Royal Medical and Chirurgical Society of London, vol. xxxiv., p. 14, Case 4. London: Longmans, Green & Longmans, 1851. Also copied in

(Ref. 6) Clinical Reports of Ovarian and Uterine Diseases, with Commentaries, by Robert Lee, M.D., F.R.S. London: John Churchill. 1853, p. 88, Case 4.

(Ref. 7) Chapters on Diseases of the Ovaries translated by permission from Kiwisch's Clinical Lectures, etc., by John Clay. London: John Churchill, 1860, Appendix p. 166, Table iv , Case 13.

(Ref. 8) Horatio R. Bigelow in "A Review of the Operation of Gastrotomy for Myofibromata of the Uterus, with Complete Statistical Tables." Reprint from AMERICAN JOURNAL OF OBSTETRICS AND DISEASES OF WOMEN AND CHILDREN for 1883. pp. 46 and 47, Case 52

(Ref. 9) The History and Statistics of Ovariotomy and the Circumstances under which the Operation may be regarded as Safe and Expedient (prize dissertation of Massachusetts Medical Society, May, 1856), by Geo. H. Lyman. Boston: John Wilson & Son, 1856, Case 199, p. 72.

(Ref. 10) Observations on the Extraction of Diseased Ovaria, by John Lizars. Review in the Edinburgh Medical and Surgical Journal, vol. xxiv., 1825, part ii., Art. 4, p. 176, Case 4.

No.	Date.	a. Operator. b. Reporter.	Age.	Diagnosis	Completed or incomplete.	Operative procedure.
2	1842, Oct. 26.	a. Chas. Clay. b. Chas. Clay.	47, M.	Evidently ovarian.	Incomplete.	No anesthetic. Free abdominal incision. The tumor was punctured with a fine stiletto, but only blood flowed. The operation was abandoned and the incision united by sutures and plasters.
3	1843, Oct. 19.	a Hy Walne b Hy. Walne	45, S.	Ovarian. Dropsy.	Incomplete.	Incision 15 inches long. Left ovarian tumor removed. Ligatures brought out through the wound, which was coaptated with 18 sutures and adhesive plaster.
4	1843, Nov. 17.	a. Chas. Clay. b. Chas Clay.	45, M.	Evidently ovarian.	Completed.	No anesthetic Incision 13 inches long. Ligatures were placed around Fallopian connections and central uterine attachment and hysteromyomectomy performed The vessels were secured with difficulty.
5	1843, Nov. 21	a A. M Heath. b. A. M. Heath.	46, S.	Ovarian. believed to be attached to the uterus.	Completed	Incision from a little below ensiform to an inch and a half of pubis. Two double ligatures passed through the cervix below tumor by aneurismal needle and so tied as to include the broad ligaments. Supravaginal hysterectomy. Wound closed with 7 interrupted sutures and adhesive plaster.

Description of tumor.	Result.	Bibliography.
A firm, highly vascular, very adherent tumor, estimated to weigh 35 pounds. Two pints of thick, bloody fluid had flowed on tapping two years previously. After operating Clay considered it "was not an ovarian disease." Positive proof that this was a uterine fibroma not found.	Died sixth day. No postmortem.	(Ref. 11) Cases of Peritoneal Section for the Extirpation of Diseased Ovaria by the Large Incision from Sternum to Pubis Successfully Treated with Other Cases of Extirpation of Anomalous Tumors etc , etc.. by Chas. Clay. Case the third. The Medical Times, London, Saturday, November 26 1842, No. 166, vol. vii., p. 139. (Ref. 12) Published also in pamphlet, 4to, pp 18, London, 1842. (Ref. 13) See also critical review of this pamphlet in the British and Foreign Medical Review, vol xvi., Art. 10, October, 1843, p. 387, for an opinion of Clay's observations.
Two interstitial uterine fibroids; the larger, involving the fundus and posterior wall of the uterus, occupied the pelvis. The smaller, of the size of a French walnut, was in the anterior uterine wall. The ovarian cysts weighed 14 pounds while there were 5 gallons of ascitic fluid.	Death nine days after operation. Autopsy.	(Ref. 14) Cases of Dropsical Ovaria removed by the Large Abdominal Section. Fourth Case, by Dr Henry Walne. The London Medical Gazette, vol. i., new series, 1843–44, p. 723, Friday, March 1, 1844. (Ref. 25) On Tumors of the Uterus and its Appendages, by Thomas Safford Lee, M.R.C.S.E. London : John Churchill, 1847, p. 268, No. 70.
Solid, highly vascular tumor, weighing 13 pounds. The uterus formed part of the tumor, while the Fallopian tubes were attached along their entire length.	Died about one and a half hours after operation, from "shock."	Cases of Peritoneal Section, etc., by Chas. Clay. See refs. 11 and 12. The London Medical Times, No. 167, vol. vii., London. Saturday, December 3, 1842, p. 153. An Analysis of 108 Cases of Ovariotomy etc., by R. Lee. See refs. 5 and 6. P. 21, Case 47.
Submucous glandular fibrous tumor weighing 6 pounds. Vertical diameter. 7 inches; circumference, 20 inches.	Death from hemorrhage seventeen hours after the operation. About 14 ounces of blood found in peritoneal cavity post mortem.	(Ref. 15) A. M. Heath: Case of Excision of the Uterus by the Abdominal Section. London Medical Gazette, 1843, p. 309, December 8, new series, vol. i. R. Lee: Analysis of 162 Cases of Ovariotomy. Medical and Surgical Transactions, vol. xxxiv., 1851, p. 25, Case 90. See refs. 5 and 6.

№	Date.	a. Operator. b. Reporter.	Age.	Diagnosis.	Completed or incomplete.	Operative procedure.
6	1844. Jan. 16	a. Chas. Clay. b. Chas. Clay.	52, M.	Ovarian	Completed.	Incision 12 inches long. Uterus and both ovaries removed, converting vagina into a cul-de-sac. (The first abdominal panhysterectomy.)
7	1847.	a. S. Lane..	22. S.?	Not found.	Incomplete.	Incision from umbilicus to pubis. Too great connection with the uterus for removal.
8	1854. Oct. 11.	a. Mr. Eddison. b. John Sloane.	33, S.	Ovarian	Completed.	Chloroform. Incision from umbilicus to pubis. Pedicle transfixed with whipcord and the four ends tied. Tumor removed.
9	1860. May 15.	a. Baker Brown.	45, S.	Ovarian	Incomplete.	Operation abandoned....
10	1861, June 21.	a. Baker Brown. b. Baker Brown.	34, W.	Right ovarian fibroma.	Completed.	The broad ligaments were secured with calipers and uterus transfixed with double ligature, tied. and cut away. About one-third of uterus was thus removed. A small fibroid remaining in cervix was also tied off.
11	1861, Oct. 14.	T. Spencer Wells.	33, M.	"Ovarian" (Clay and Wells), although there was some doubt before the operation.	Completed.	Incision 10 inches long. Supravaginal removal of tumor. uterus, and ovaries. Écraseur tried, but it bent. Clamp tried, but it broke. Bleeding vessels then tied. Ligatures from pedicle brought out at lower angle of wound.
12	1862, May 14.	a. F. D. Fletcher. b. F. D. Fletcher.	40, W.	Ovarian	Completed.	Incision about 9 inches long. Pedicle divided with écraseur. A few spouting vessels ligated with iron wire. Pedicle returned to abdomen and ligatures left in its cavity. Skin united with wire sutures and harelip pins.

Description of tumor.	Result.	Bibliography.
Uterus enlarged to nearly 20 lbs., left ovary to 4 lbs.; cystic deposit, 8 lbs.; total, 32 lbs. Kind of tumor not stated.	Death fifteenth day. Patient dropped to floor by nurse.	(Ref. 16) Chas. Clay. Manchester: Observations on Ovariotomy, Statistical and Practical; also a Successful Case of Entire Removal of the Uterus and its Appendages. Transactions of the Obstetrical Society of London, vol. v , p. 66, March 4, 1863.
Tumor the size of uterus at term, connected with the uterus.	Recovered. Died suddenly five weeks later; no evidence of inflammation.	R. Lee: Analysis of 162 Cases of Ovariotomy (see refs. 5 and 5), p. 19, Case 31. Chapters on Diseases of the Ovaries, translated by permission from Kiwisch's Clinical Lectures by John Clay. London: John Churchill, 1860. Appendix, Table iv., Case 11, p. 166. (Ref. 7.)
" Cystic fibrous tumor " (Mr. Paget) weighing 50 oz., attached by pedicle 1½ inches in diameter, to the fundus. Ovaries not enlarged. Had been tapped 7 pints, October 7 ?	Death five hours later.	(Ref. 17) Nottingham General Hospital. Gastrotomy; Removal of Fibrous Tumor of the Uterus; Death. By John Sloane, M.D. (read before the Leicester Medical Society, February 2, 1858). British Medical Journal, London, Saturday, February 27, 1858, No. 61, new series, p. 159.
Fibrocyst of uterus, extensive adhesions. Ovaries not involved.	Death twenty-four days after operation; erysipelas.	(Ref. 19) De la Gastrotomie dans les Cas de Tumeurs fibreuses utérines, etc., par le docteur Boinet. Gazette hebdomadaire de Médicine et de Chirurgie, 18 Juillet, 1873, No. 29, p. 462, Case 14, deuxième serie, tome x. (Communicated by M. Routh)
Interstitial multinodular myoma of fundus weighing 7 pounds 5 ounces.	Death eighteenth day; pyemia; pus in iliac and uterine veins.	(Ref. 20) History of a Fibrous Tumor within the Abdomen; Exploration by Abdominal Section; Removal, Examination of Tumor, and Autopsy, by T. Baker Brown, F.R.S.C. London Medical Review or Monthly Journal of Medical and Surgical Sciences, vol. ii., January, 1862, p. 320.
Non-adherent interstitial uterine fibroma weighing 27 pounds.	Death from exhaustion, fourth day.	(Ref. 21) (Do not confuse with ref. 4.) Diseases of the Ovaries, by T. S. Wells. London, vol. i., 1865, p. 350, John Churchill & Sons. Ovarian and Uterine Tumors, by T. Spencer Wells, Case 1, p. 512. See ref. 23.
Fibrocystic adherent tumor, the size of the uterus at term, attached by pedicle, 1½ inches in diameter, just below fundus on posterior surface of the uterus to the left of the median line.	Recovered ...	(Ref. 22) Uterine Tumor Successfully Removed. F. D. Fletcher. Transactions of the Liverpool Medical Society, Thursday, October 16, 1862, in British Medical Journal, vol. ii., 1862, No. 8, p. 499.

No.	Date.	a. Operator. b. Reporter.	Age.	Diagnosis.	Completed or incom- plete.	Operative procedure.
13	1863, Jan. 2.	a. Chas. Clay b. Chas. Clay.	S.	At first consider ed to be uterine, after- ward thought probably ovarian.	Com- pleted.	Incision about 11 inches long. Broad ligaments and the cervix ligated with hemp ligatures. Supravaginal hyste- rectomy with removal of ovaries. Ligature ends brought out through the wound. Duration 15 minutes
14	1863, Jan. 12.	a. T. S. Wells. b. T. S. Wells.	35, S.	Correct ..	Com- pleted.	Incision 6 inches long. Tumor removed by emucleation, and ute- rine incision closed by uninterrupted suture.
15	1863. April 7.	a. T. S. Wells b. T. S. Wells.	33, S.	Probably uterine(?) as Wells states that he consider- ed it in- operable and ope- rated to satisfy his friends.	Incom- plete.	Short exploratory inci- sion. Solid tumor punctured, but no fluid escaped.
16	1863, April 30.	a. T. S. Wells. b. T. S. Wells.	53, S.	Ovarian ..	Com- pleted.	Incision 9 inches long. Ligatures passed below Fallopian tubes. Tu- mor, right ovary, and two small uterine fibroids removed. Ligatures brought out through wound. Ute- rus not removed.
17	1863, July 28	a. T. S. Wells. b. T. S. Wells.	55, S.	Ovarian ..	Com- pleted.	Incision 4 inches long. Clamps to ovarian and écraseur to uterine pedicle. Tumors re- moved.
18	A few years prior to Dec., 1865	Meadows ...	....	Incom- plete.	Celiotomy ....

Description of tumor.	Result.	Bibliography.
Interstitial uterine fibroid weighing 11 pounds. Multinodular, without adhesions.	Recovered	Observations on Ovariotomy. Chas. Clay. Transactions of Obstetrical Society of London, v., 1864, p. 67. See ref. 16.
Intramural fibrous tumor, weighing 17 pounds, forming the right half of body and fundus of uterus, and containing 1 or 2 pints of serous fluid in its interstices.	Death in four hours from hemorrhage and chloroform.	Diseases of the Ovaries, their Diagnosis and Treatment, by T. Spencer Wells, vol. i . p. 363. John Churchill & Sons, London, 1865. See ref. 21. (Ref. 23) On Ovarian and Uterine Tumors, their Diagnosis and Treatment, by T. Spencer Wells. London: J. & A Churchill. 1882, p. 512, Case 2.
At autopsy, sixteen months later. a uterine fibroid weighing 25 pounds, and surrounded by 34 pints of fluid, was found.	Recovered from operation. (Died August 26, 1864.)	Diseases of the Ovaries, their Diagnosis and Treatment, by T. Spencer Wells. London, 1865, vol. i., p. 353. See ref. 21. Ovarian and Uterine Tumors, by T. Spencer Wells. See ref. 23.
Fibrocystic out growth of uterine fundus, with some parietal and omental adhesions. Weight. 16 pounds 5 ounces. Its cysts contained 26 pints, of fluid and 4 pounds of "clot." Right ovary adherent to tumor.	Death in three or four hours from shock and chloroform. Autopsy. Peritoneum almost cartilaginous from thickening.	Diseases of the Ovaries, by T. S. Wells, vol. i . 1865, Case 3, p. 354. See ref. 21. Ovarian and Uterine Tumors, by T. S. Wells, p. 512, No. 3. See ref. 23.
Uterine fibroid, the size of a small orange. springing by a pedicle 1 inch long from posterior surface of the uterus. Left ovarian cystoma.	Death forty-four hours later; no hemorrhage or peritonitis found.	Diseases of the Ovaries, by T. S. Wells. 1865. vol i., p. 186, Case 72. Ref. 21,
Two tumors, one uterine and one omental.	....	(Ref. 24) Extrauterine Pregnancy, its Causes, Species, Pathological Anatomy, Clinical History, Diagnosis, Prognosis, and Treatment, by John S. Parry, M.D., chapter viii.. p 173. Henry C. Lea, Philadelphia, 1876.

CONTINENTAL TABLE.

FIBROMYOMAS.

No.	Date.	Operator.	Age. M.,S.,W.	Preliminary diagnosis.	Completed or incomplete.	Operative procedure.
1	Feb. 28, 1859, Paris.	A.A. Boinet	29, M.	Incorrect.	Completed.	Removal of tumor....
2	Aug. 31, 1861.	E. Koeberlé	34.	....	Completed.	Incision 33 centimetres long. Ligature, cautery, and serre-neud employed. Duration, two and a half hours.
3	March 14. 1863.	"	24, S.	....	Completed.	Incision 55 centimetres long. Tumor removed by ligature and serre-neud. Previously tapped several times.
4	April 20, 1863.	"	30, M.	Correct...	Completed.	Incision 26 centimetres long. Supravaginal amputation, two ligatures to cervix and clamps to broad ligaments, which were brought outside.
5	July 22, 1866.	Gayst	38, M.	....	Completed.	Long incision. Tumor removed. Ligatures and écraseurs in the wound. Duration of operation, five and a half hours.
6	Nov. 15, 1863.	A A. Boinet.	43, M.	....	Completed.	Incision 10–12 centimetres long Supravaginal amputation of cervix. Silk ligatures used and brought out at the lower wound angle. Duration, one hour.
7	Nov. 21, 1863.	E. Koeberlé.	...	....	Completed.	Tumor removed ......
8	Dec. 5, 1863.	"	35, M.	... .	Completed.	Incision 16 centimetres. Serre-neud. Tumor moved. Previously tapped thirty times.
9	Dec, 19. 1863.	E. Koeberlé.	36, S.	Correct...	Completed.	Incision 25 centimetres long. Serre-neud and ligatures used and brought outside. Tumor and greater part of uterus removed.

CONTINENTAL TABLE.

Fibromyomas.

Description of tumor.	Result.	Bibliography.
Fibroid tumor with a cyst, adherent to omentum and intestines.	Death........	(Ref. 1) A. A. Boinet, Gaz. hebd. Méd et Chir., No. 8, 1873, p 462, Case 14. Bull. de la Soc. de Chir., vol. ii., second series, p. 688.
Fibroplastic periuterine tumor of uterine fundus, weighing 14½ kilos.	Recovered....	(Ref. 2) (Orig. Rep) Gaz. hebd. Med. et Chir., 6, 1869. Larry, Bull. Acad. Méd. Paris, 34. 1869, p. 113. (Ref. 3) Demarquay, ibid., 1, 1872. (Ref. 4) Med. Times and Gazette, Feb., 1865, p. 209. Also Ref. 10.
Fibroid pediculated tumor attached to left angle of fundus, weight 33 kilos. Everywhere adherent.	Death from exhaustion third day.	(Ref. 5) Koeberlé, Gaz. méd. Strass., 1864, p. 160. (Ref. 6) Gastrotomie, 1866, p. 2. Also Ref. 1.
Fibroid uterine tumor weighing 7 kilos. Adhesions to omentum. Right ovary diseased.	Recovery.....	(Ref. 7) Koeberlé, Gaz. méd. Strassburg, 1863, p. 153. (Ref. 6) Gastrotomie, 1866, p. 47.
Nodulated fibroid tumor attached to right lateral side of uterus. Weight, 13 (?) kilos.	Death; shock.	(Ref. 8) Lyon. Méd., 1869, p. 323, No 5. (Ref. 9) Pozzi, Paris. 1875, p. 88.
Fibroid of uterine fundus weighing 4 kilos and 250 grammes.	Death fifth day, peritonitis.	(Ref. 10) A. A. Boinet, Traité prat. des Malad. des Ovaires, 1867, p. 420.
Vascular pediculated tumor of uterus. Ascites.	Death; peritonitis.	(Ref. 1) Boinet, p. 462. (Ref. 11) Caternault, p. 28. (Ref. 9) Pozzi. p. 45.
Vascular pediculated uterine fibroid with a broad pedicle, complicated with ascites.	Death in eighteen hours.	(Ref. 12) Koeberlé, Gaz. méd. Strass., 1865, p. 79. (Ref. 11) Caternault, p. 4. (Ref. 13) Boinet, Gaz. hebd. Med. et Chir., 1873, No. 18. p. 258.
Fibrocyst of uterus. Weight, 4½ kilos. Appendages healthy.	Died; hemorrhage.	(Ref. 14) Koeberlé, Gaz. méd Strass., 1865, p. 165. (Ref. 11) Caternault, p. 165.

AMERICAN TABLE

FIBROID OPERATIONS

No.	Year	Month and day	Operator.	Diagnosis correct.	Diagnosis not definite, but not strictly incorrect.	Diagnosis incorrect.	Completed hysterectomy	Completed myomectomy	Abandoned or exploratory	Result Rec.	Result Dth.	Cause of death.	References.
1	Before 1831	....	N. Smith.. ...	0	0	1	0	0	1	?	?	0	1.
2	1844	Aug. 28 ..	W. L. Atlee...	0	0	1	0	1	0	R.	0	0	2, 3, 4.
3	1844	... .	J. L. Atlee ...	?	?	?	0?	1?	0	0	D.	Hemorrhage.	5.
4	1846	June	John Bellinger.	1?	0	0	1	0	0	0	D.	Peritonitis.	6.
5	1848	Jan. 8....	Samuel Parkman.	0	0	1?	1	0	0	0	D.	Hemorrhage.	7.
6	1848	June 6...	J. Deane	0	1?	0?	0	0	1	R.	0	0	8.
7	1849	May 22...	W. L. Atlee...	0	1	0	0	0	1	R	0	0	9, 3, 10, 11, 5.
8	1849	Oct. 13...	"	0	0	1?	0	0	1	R.	0	0	3.
9	1849	Nov. 24...	"	0	1	0	0	1	0	R.	0	0	3, 4.
10	1849	Dec. 29...	H. J. Bigelow.	?	?	?	0	0	0	0	D .	....	11, 12.
11	1849	. ...	....	?	?	?	1	0	0	0	D .	....	13.
12	1850	April 13 .	W. L. Atlee ..	0	0	1?	0	0	1	R.	0	....	3.
13	1850	....	R. D. Mussey	0	0	1?	9	0	1	0	D.	Exhaustion.	14, 15.
14	1851	May 20...	W. L. Atlee...	1	0	0	0	1	0	0	D.	Hemorrhage.	3, 4.
15	1851	June 12 .	John B. Hayes.	?	?	?	0	1	0	R	0	0	16.
16	1851	Dec. 20...	W. L. Atlee..	0	1	0	0	0	1	R.	0	0	3, 10.
17	1853	March 3 .	"	?	?	?	0	1	0	0	D.	Peritonitis.	3.
18	1853	June 26 ..	W. Burnham.	0	0	1	1	0	0	R.	0	0	17, 18, 19
19	Before Sept. 1853	... .	G Kimball....	0	0	1	1	0	0	0	D.	....	20.
20	1853	Sept. 1...	"	1	0	0	1	0	0	R	0	0	20, 21.
21	1853	Sept. 21 .	E. R. Peaslee.	0	0	1	1	0	0	0	D.	Strangulation of bowels.	22.
22	1853	Oct. 12 . .	G. Kimball ...	?	?	?	0	0	1	0	D.	....	23.
23	1854	Aug. 12 ..	Dr. Herff	0	0	1	0	1	0	R.	0	0	24.
24	1854	August..	W. Burnham.	?	?	?	1	0	0	0	D.	Septicemia.	18, 19.
25	1854	Sept 30 ..	W. L. Atlee ..	?	?	?	0	1?	0	0	D.	Hemorrhage.	3.
26	Between 1853 and 1855	Sept. 5...	G. Kimball ...	1?	0	0	1	0	0	0	D.	"	20, 21.
27	1856	Nov. 13...	Wm. J. Baker.	0	1	0	1	0	0	R.	0	....	25, 26, 27
28	1857	June....	W. Burnham .	1	0	0	1?	0	0	0	D	....	18, 19.
29	1857	November.	"	1	0	0	1	0	0	0	D.	Shock; exhaustion.	18, 19.
30	Before 1857	....	Bradford and Dunlap.	1	0	0	1?	0	0	0	D.	....	28.
31	1858	February	W. Burnham	1	0	0	1	0	0	0	D.	Shock ...	18, 19.
32	1859	June 8...	A. F. Sawyer	0	0	1	1	0	0	0	D	Hemorrhage; peritonitis.	29.
33	Before 1859	November.	A. C. Blackman	0	0	1	0	0	1	0	D.	....	14.
34	Before 1860	....	Dr. Nelson,...	?	?	?	0	?	?	R.	0	......	29.
35	1862	June 18 ..	W. L. Atlee...	0	0	1	0	1	0	0	D.	....	3.
36	1863	Oct. 26...	Packard......	0	0	1	0	0	1	0	D.	Peritonitis.	30.
				5		14	15	10	10	13	22		

ENGLISH TABLE.

No.	Year.	Month, day.	Operator.	Age—M., S., W.	Diagnosis correct.	Diagnosis obscure or incorrect.	Completed.	Exploratory abandoned or	Hysterectomy, supravaginal.	Hysterectomy, total.	Myomectomy.	Recovered.	Died.	Cause and time of death.	Bibliography. Numbers refer to bibliography of large table.
1	1825	April 24.	John Lizars.	34 S	0	1	0	1	0	0	0	1	0	0	1, 2, 3, 4, 5, 6, 7, 8, 9, 10.
2	1842	Oct. 26.	Chas. Clay.	47 M.	0	1	0	1	0	0	0	0	1	6th day...	11, 12, 13.
3	1843	Oct. 19.	Hy. Walne.	45 S.	0	1 ? 0		1 ?	0	0	0	0	1	9th day...	14, 25.
4	1843	Nov. 17.	Chas. Clay.	45 M	0	1	1	0	1	0	0	0	1	Hemorrhage.	5, 6, 11, 12
5	1843	Nov. 21.	A M. Heath.	46 S.	0	1	1	0	1	0	0	0	1	Hemorrhage.	15, 5, 6.
6	1844	Jan 16.	Chas. Clay.	52	0	1	1	0	0	1	0	0	1	Dropped 15th day.	16.
7	1847	......	Lane...	22 S.	0	1	0	1	0	0	0	1	0	0	5, 6, 7.
8	1854	Oct. 11	Eddison	33 S.	0	1	1	0	0	0	1	0	1	5 hours.	17.
9	1860	May 15.	Baker Brown	45 S	0	1 ? 0		1	0	0	0	0	1	?	19.
10	1861	June 21.	Baker Brown	34 W.	0	1	1	0	1	0	0	0	1	Sepsis.....	20.
11	1861	Oct. 14.	T. S. Wells	33 M	0	1	1	0	1	0	0	0	1	Exhaustion 4th day.	21, 23.
12	1862	May 14.	F. D. Fletcher	40 W.	0	1	1	0	0	0	1	1	0	0	22.
13	1863	Jan. 2	Chas Clay.	— S.	0	1	1	0	1	0	0	1	0	0	16.
14	1863	Jan. 12.	T. S Wells	35 S.	0	1 ? 1		0	0	0	1	0	1	Hemorrhage	21, 23.
15	1863	April 7.	T. S. Wells.	33 S.	1 ?	0	0	1	0	0	0	1	0	0	21, 23.
16	1863	April 30.	T. S. Wells	53 S	0	1	1	0	0	0	1	0	1	Shock, 3 hours	21, 23.
17	1863	July 28	T. S. Wells.	55 S.	0	1	1	0	0	0	1	0	1	Asthenia, 44 hours	21.
18	About 1863	......	Meadows	?	0	1 ? 0 ?		1 ?	0	0	0	?	?	?	24.
					1 ?	17	11	?7	5	1	5	5	12		

CONTINENTAL TABLE.

FIBROID OPERATION.

No.	Year	Month and day.	Operator.	Age.	M., S., W.	Diagnosis correct.	Diagnosis obscure or incorrect.	Operation completed.	Operation, exploratory or abandoned.	Hysterectomy, supravaginal.	Hysterectomy, total.	Myomectomy.	Recovered.	Died.	Cause of death.	Bibliography.
1	1858	June 17.	A. A. Boinet	29	M	..	....	1	0	1?	..	0	0	1	....	1.
2	1861	Aug. 31.	E. Koeberlé.	34	..	..	....	1	0	1	0	..	1	0	....	2, 3, 4.
3	1863	Mch. 14.	E. Koeberlé.	24	S	..	....	1	0	...	..	1?	0	1	Exhaustion 3d day.	5, 6.
4	1863	Apr. 20.	E. Koeberlé.	30	M	1	....	1	0	1	0	0	1	0	....	6, 7.
5	1863	July 22.	Gayst.	38	M	..	....	1	0	..	..	1?	0	1	Shock....	8, 9.
6	1863	Nov. 15.	A. A. Boinet	43	M	..	....	1	0	1	0	0	0	1	5th day. Peritonitis.	10.
7	1863	Nov. 21.	E. Koeberlé.	..	..	..	....	1	...	....	..	1	0	1	Peritonitis.	9, 10, 11.
8	1863	Dec. 5.	E. Koeberlé.	35	..	..	1?	1	0	0	0	1?	0	1	18 hours..	11,12,13.
9	1863	Dec. 19.	E. Koeberlé.	36	S	1	....	1	0	1	0	0	0	1	Hemorrhage 2 hours...	11, 14.
						2	1?	9	0	5	0	3?	2	7		

THE OPERATION FOR COMPLETE TEAR OF THE PERINEUM.[1]

BY

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(With six illustrations.)

I PUBLISHED in the first number of the *Johns Hopkins Bulletin* of this year a paper upon "The Dissection and Liberation of the Sphincter Ani Muscle followed by its Direct Suture in Cases of Complete Tear of the Perineum, etc." I

[1] Read before the American Gynecological Society. May 24, 1899.

endeavored in this article to make prominent the following three points: first, that injuries to the exterior sphincter muscle are overlooked; second, that the control of the bowel may reside in some measure in the internal sphincter muscle; and third, that the best method of treatment of a torn sphincter is by liberating it from the surrounding tissue and then uniting the freed ends by buried catgut sutures.

I endeavored to show in this paper that the results of this method of suturing were far better than those obtainable by any of the methods generally practised which depend upon the approximation of broad surfaces, including the sphincter ends, without using any special plan of suturing to hold the ends in accurate apposition. Under these older plans of treatment complete failure occasionally occurs, and quite frequently the result is imperfect; a fistula may form communicating with the vagina or vulva, or the control over the function of the bowel may be so imperfect at first that it is often found necessary to comfort the patient by assuring her that she will be able to learn to control the sphincter after the lapse of a few weeks or months.

These results from the old operation are due, I feel sure, to the absence of a direct union re-establishing the continuity of the sphincter. In place of this direct union between the ends there is substituted more or less cicatricial tissue, and it becomes necessary for the patient to gain control over her bowel by teaching the sphincter to contract up to the scar as a fixed point; the power of concentric contraction is gone.

The direct suture of the muscle by buried catgut suture does away with these difficulties and gives the patient, what she actually possesses, an immediate sense of control over her rectal functions. These conclusions have been strengthened by the work of Dr. Le Conte, Dr. Baldy, Dr. Shoemaker, Dr. Bovée, and Dr. Noble of Atlanta.

It is now my desire to come before the Society with twelve more cases to add to the eleven previously reported; these cases in each instance have resulted satisfactorily and serve to illustrate abundantly the advantages of the new procedure. It is not, however, of this I wish to speak to-day, but I desire to bring before the Society two important points which I think serve to relieve the operation entirely of the risks of infection.

The plan of operating just spoken of above, involving as it does the use of buried sutures, instead of diminishing, actually adds to the risks of infection, while the ordinary plan of

operating is always exposed to this danger from two causes: one is the line of sutures on the side of the rectum closing the rectal wound, and the other is the difficulty of avoiding leaving a dead space in the centre of the perineum between the sutures radiating into rectal, vaginal, and perineal surfaces.

I have adopted in the last three cases on the list the following plan, by means of which these difficulties have been ob-
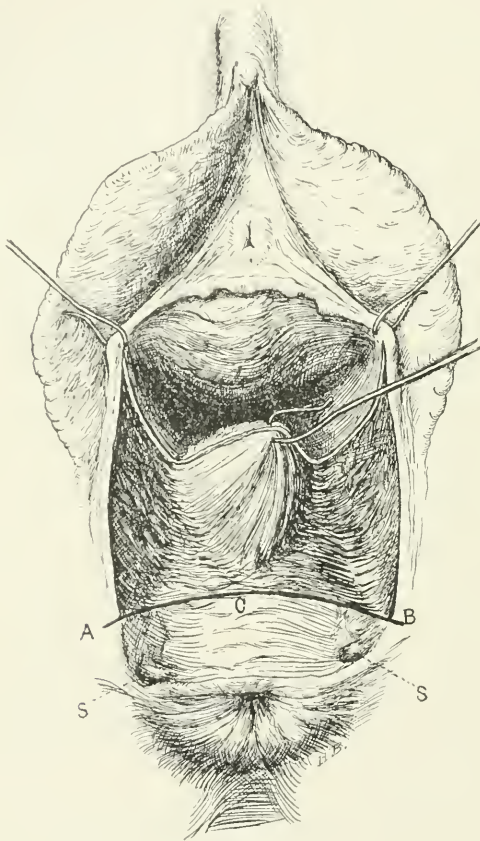
FIG. 1.

viated. In order to avoid the possibility of infection from the side of the rectum, I have denuded in such a fashion that there is no rectal wound whatever. The operation is performed as follows: An incision is carried across the septum at least a centimetre—more if the tear is a deep one—above the margin between the junction of the rectal and vaginal mucosa. This incision extends across the whole septum and above and beyond the sphincter ends (Fig. 1). Taking this as a base line, the

operation on the vulvar and vaginal portion of the rent is then made in the usual manner as in the case of repair of an ordinary relaxed vaginal outlet. Having completed the denudation of these parts, with the bilaterally symmetrical triangles in the south side and the undenuded tongue of tissue on the posterior column, the operator then turns his attention to the complicating condition, the rectal side of the tear.
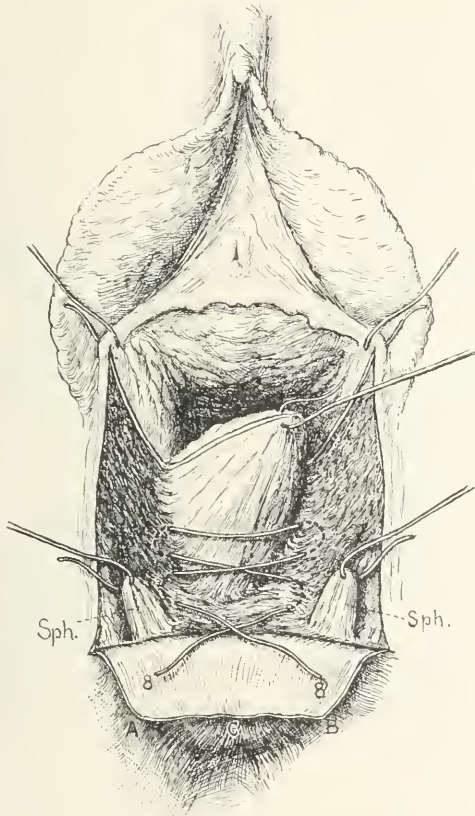
Fig. 2.

He inserts his left index finger into the bowel and draws the septum a little forward, and then carefully dissects the strip of undenuded tissue described above so as to free it and to turn it down like an apron. A carefully conducted dissection will expose the internal sphincter muscle and avoid buttonholing the bowel (Fig. 2). At the sides of this flap the ends of the sphincter muscle are caught up and liberated in the manner described in

my previous paper. The purpose of this flap is to turn down
an apron or fold of tissue which, when the sutures are all in
place, projects out of the anal orifice and points in a direction
away from the impact of the fecal masses. By making this
apron, the operator is able to avoid the presence of a wound
on the rectal surface and thus the most serious complicating
condition is removed. When the denudation is complete and
the apron turned down, the operator will then be able to avoid
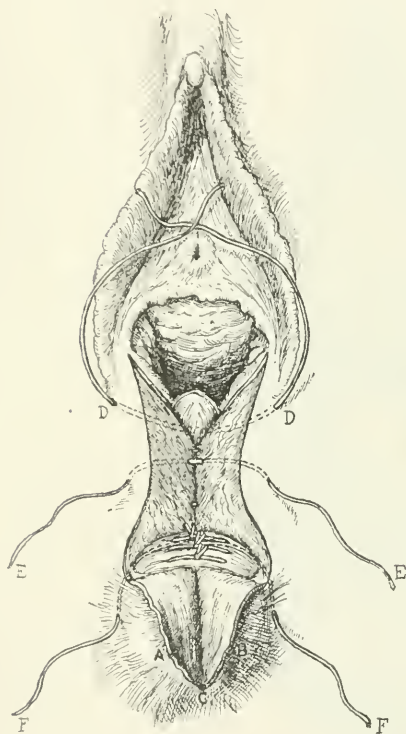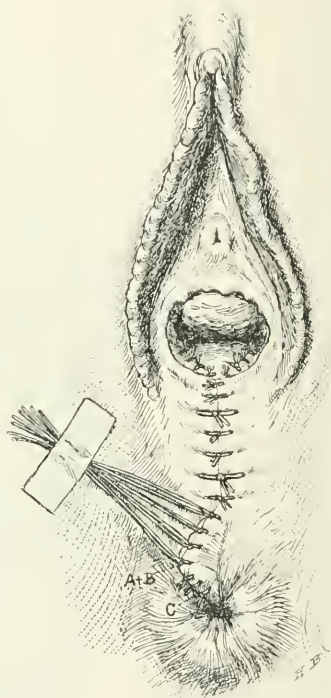
Fig. 3.   Fig. 4.

the second complication, the presence of a dead space in the
centre of the septum, by the following plan of suturing:
About three or four catgut sutures are applied in the form of
the figure-of-eight, beginning above and introducing each
suture so as to grasp the fibres of the internal sphincter muscle
well to one side of the median-line sutures, then carried to the
opposite side, then passed through the tissues in the septum
well above the internal sphincter; it then returns to the first

side and includes the corresponding area of tissue, and is finally
brought out through the internal sphincter at a point corre-
sponding to the point of entrance (F gs. 5 and 6). This entire
suture is buried in the septum, and no part of it appears on
any part of the surface. By the use of three or four sutures
of this kind broad plain surfaces are brought together in the
middle of the septum and the space is obliterated in which
accumulations are so apt to form. The use of this figure-of-
eight in this way takes the place of a much larger number of
interrupted sutures, and moreover, instead of securing a thin
line of union with weak spaces between, approximates planes.

After uniting the centre in this way as the first important
step in the suturing, the next step is to pass the sutures on the
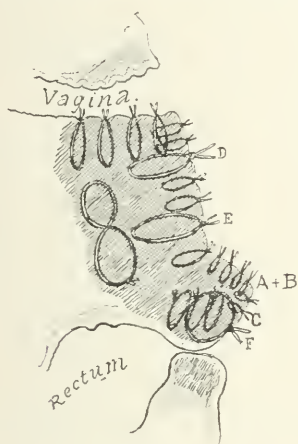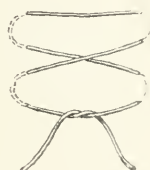
FIG. 5.   FIG. 6.

vaginal surface, approximating the triangles there. The next
sutures are applied on the perineal surface, and here I com-
monly use two or three common silkworm-gut sutures in
addition to the catgut sutures between them (Fig. 3).

The final step in the operation is the union of the edges of the
apron, which lie now more or less crumpled together and pro-
jecting at the anus; by leaving these sutures long and making
slight traction, this entire line can be drawn well outside and
fixed on the buttocks by a strip of adhesive plaster (Fig. 4).

I append the following cases, twelve in number, which have
been operated upon by these methods; only in the last three,
however, have I applied the new principle of turning down the
flap from the septum.

NEW CASES OF REPAIR OF RUPTURED RECTO-VAGINAL
SEPTUM.

CASE I.—Mrs. H., age 41. Complaint, laceration of five years' duration. The patient has been married seven years and has had two children; in the delivery of both, instruments were used. An unsuccessful attempt was made to repair the tear occurring with the first labor. The bowels are regular, but there has been an increase in the frequency of micturition.

Examination showed a relaxed vaginal outlet and an old tear through the recto-vaginal septum, with, however, good control of the bowels, the muscle loss being made up by a connective-tissue bridge. Two small nodules were seen, one on vaginal wall, the other on labium.

Operation (September 14, 1898) [Dr. Russell].—Removal of nodule from labium and vaginal wall. Sphincter ends dissected out and brought together after closing in the bowel. The relaxed vaginal outlet repaired in the usual way.

The result was good and convalescence uninterrupted.

CASE II.—Mrs. T., age 22. Complaint, bearing-down pains and incontinence of feces. The patient has been married five years and has had one child, now 4 years old. Labor was hard, lasting six days, and at the birth of the child she sustained a complete perineal tear. Since then she has had no control of her bowels, and has also suffered a great deal with bearing-down pains, soreness in the back, and pain in both ovarian regions.

Examination showed greatly relaxed vaginal outlet; rupture of recto-vaginal septum with separation of sphincter ani muscle; partial prolapse of cervix.

Operation (October 22, 1898) [Dr. Stokes].—Restoration of recto-vaginal septum in usual manner, the sphincter ends being dissected out and brought together with catgut and silkworm gut.

The result of the operation was good, and the convalescence uneventful except for numerous epileptic attacks, which, however, the patient had been having for many years. The bowel control was perfect.

CASE III.—Mrs. D., age 39. Complaint, pain in right side, backache, and incontinence of feces. The patient has been married thirteen years and has had four children; all the deliveries were instrumental, and with the first child there was a complete tear. Ever since the birth of the first child,

twelve years ago, the patient has had but partial control over the bowel function; she also complains of pains in the right lower abdomen. The bowels are usually regular and there is no increase in the frequency of micturition.

Examination showed a very markedly relaxed vaginal outlet, the anterior wall being very redundant, the posterior fourchette converted into a transverse cicatricial band occupying the upper margin of the anus.

Operation (January 4, 1899) [Dr. Stokes].—Dilatation and curettage of uterus for a polypoid condition of the endometrium, followed by the operation for ruptured recto-vaginal septum, a large amount of cicatricial tissue being dissected away, the sphincter ends dissected free and united, and the rest of the denudation and union carried out in the usual way.

The patient made an uninterrupted recovery; regained perfect control of the bowel function, and, on rectal examination, the sphincter was found to be intact, grasping the finger firmly all the way around.

CASE IV.—Mrs. H., age 26. Complaint, lack of control of bowels, headache, and pain in the lower abdomen. The patient has been married ten years and has had one child and four miscarriages. The labor which occurred nine years ago was hard and long, and finally completed by instrumental interference. Since the labor of nine years ago the patient has lacked any control whatsoever over the bowel function. An unsuccessful attempt to repair the tear had been made six weeks ago, followed by a miscarriage three weeks ago.

Examination showed a relaxed outlet, complete rupture of recto-vaginal septum; the anterior portion of the sphincter ani was completely wanting, there being but a bridge of mucous membrane between rectum and vagina.

Operation (January 14, 1899) [Dr. Kelly].—Restoration of septum by a new procedure; dissection of rectum from septum so as to expose internal sphincter, which was separately sutured by two rows of sutures; isolation of external sphincter and union of ends with three buried catgut sutures; silkworm-gut splinting suture passed through sphincter muscle instead of behind it.

Note made on January 28 showed that the result was perfect and the sphincter action was present and functionating well. Later the patient began to develop some abdominal tenderness and began to pass blood per vaginam; and a second operation was performed on February 10, but the patient died

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two days later. The second operation was a curettage of some retained placental tissue; during this the uterus was perforated and an abdominal incision made and the perforation repaired.

CASE V.—Miss F., age 21. Complaint, inability to control the bowels. The patient was delivered of a dead-born child at the maternity ward of the Johns Hopkins Hospital three months before her admission to the gynecological side, the labor being extremely difficult and the patient being badly torn. Since this time she has been unable to control her bowels if they are the least bit loose; consequently she tries to keep her bowels constipated.

Examination showed a complete tear of the perineum, with imperfect repair from previous operation (performed at time of delivery), and a recto-vaginal fistula.

Operation (February 18, 1899) [Dr. Kelly].—Broad denudation up into vagina and on left side, the sphincter ends being dissected out two centimetres; rectum freed from septum, setting free internal sphincter; septum brought together with four figure-of-eight catgut sutures; sphincter ends united with three buried catgut sutures; skin closed around sphincter; one silkworm-gut suture passed through the sphincter and one half-way up the perineum; vagina closed with catgut.

Result was perfect, and patient left the hospital with perfect control over the bowel function.

CASE VI.—Mrs. S., age 25. Complaint, incontinence of feces, pain in side and back. The patient has been married eight years and has had two children; the first labor was instrumental, and in it she suffered a complete tear and has never had control over fecal movements since. An unsuccessful attempt at repair was made at that time. Since then there has been entire lack of control of the bowels, increased frequency of micturition, and pain in back and side, although the general health has been excellent.

Examination showed a relaxed vaginal outlet, the relaxation, however, not being so marked as the rectal tear. The rupture extends well up into the rectum, the tear deviating to the left. The cervix uteri is in descensus and presents an exceedingly deep bilateral laceration. There is marked eversion of the rectal mucosa.

Operation (March 6, 1899) [Dr. Kelly].—The restoration was done by the dissection out of the sphincter ends after denudation, no attempt being made to separate the external from the internal fibres. In suturing, the figure-of-eight suture

was employed with most satisfactory results, there being no dead space and no uncovered raw area by this method. The everted cervical mucosa was excised afterward.

The result was perfect and the control of the bowels complete.

CASE VII.—Mrs. P., age 22. Complaint, pain in left side and some incontinence of feces. The patient has been married three years and has had one child; the labor was exceedingly difficult, lasting two days, and the child was finally delivered with forceps. The patient suffered a complete tear, since which time she has been unable to control liquid feces. Bowels as a rule are constipated, and there is some pain during micturition, with increased frequency.

Examination showed a greatly relaxed vaginal outlet; the fourchette torn completely through; a deep bilateral tear extending down to internal sphincter, with typical sphincter pits on either side; cervix in moderate descensus. The sphincter grasp was entirely wanting.

Operation (March 30, 1899) [Dr. Stokes].—The remaining portion of the cervix was first excised, with the establishment of a patulous canal. The ruptured recto-vaginal septum was next restored by the usual denudation, the dissection out of the sphincter ends and their suturing, the dead spaces being closed as far as possible with puckering sutures. The rest of the operation was performed in the usual manner.

The result was perfect; the bowel control was complete.

CASE VIII.—Mrs. M. B.

Diagnosis.—Rupture of recto-vaginal septum.

Operation (April 1, 1899) [Dr. Kelly].—Repair of recto-vaginal septum.

History not to be found at hospital.

CASE IX.—Mrs. R., age 38. Complaint, incontinence of feces. The patient has had three children, and at the second delivery, two years ago, was torn. Since then she has had absolutely no control over the fecal movements except when the bowels are constipated.

Examination showed a markedly relaxed outlet, complete tear of recto-vaginal septum, widest possible separation of sphincter ends, the tear being on the left side, leaving a large cushion of tissue on the right side, which later proved to be the entire perineum pulled over to that side.

Operation (April 12, 1899) [Dr. Kelly].—The area to be denuded was marked out with the scissors; the tissue within

these lines was removed; a flap was then turned down toward the rectum, keeping the finger in the bowel to avoid cutting into its lumen; the sphincter ends were then caught and dissected free; the septum was next closed with four figure-of-eight sutures, uniting internal sphincter and septum; the external sphincter ends then united with three buried catgut sutures; the vagina was then closed in, and, last of all, the edges of the flap were brought together, thus leaving absolutely no opening on the rectal surface.

The result was perfect, the bowel control complete.

CASE X.—Mrs. G., age 49. Complaint, womb trouble, loss of control of bowels, and nervousness. Has had five children and five miscarriages. Labors were not instrumental, but the patient was badly torn at the birth of the first and third children. After the birth of her first child the control of the bowels was somewhat imperfect, but the impairment was not marked until after the birth of the third child (now 21 years old), since when she has had almost entire loss of control of the bowel function except when constipated. For the past two years she has had considerable dyspepsia and tendency to diarrhea. The patient had had profuse hemorrhages from the uterus, and an examination revealed a myoma of the cervix uteri, besides the complete tear of the recto-vaginal septum. At the first operation (April 1, 1899) a pan-hysteromyo-salpingo-oöphorectomy was performed, and as the gall bladder was found to contain a large gall stone it was attached to the abdominal wall, opened, the stone removed, and the bladder drained. At the second operation (May 8, 1899) [Dr. Kelly] the ruptured recto-vaginal septum was repaired in the following manner: A flap was turned down from the septum one centimetre in breadth, extending from beyond the sphincter on one side, across the septum to the corresponding point on the other side; then, with the finger in the bowel, this was dissected down. The rest of the denudation was carried out in the usual manner. Three figure-of-eight sutures were used to unite the internal sphincter and septum, and the sphincter ends were then brought together by four buried catgut sutures, thus bringing the edges of the flap together; the rest of the wound was united in the usual way, and, last of all, the edges of the apron were united with interrupted catgut sutures. From this operation the recovery is, so far, of uneventful nature.

CASE XI.—Mrs. K., age 38. Complaint, nervousness and

vaginal tear. The patient has had four children, but only one living, one child being born at seven months and dying soon afterward, and two being killed in instrumental deliveries. The patient dates her present trouble from her last confinement six years ago, which was extremely difficult and instrumental. There was a tear, which was repaired by the doctor and was not thought to be very extensive. There was no incontinence of urine, and the patient had control over the bowels except when they were loose. Usually, however, the bowels have been extremely constipated since the onset of the present trouble.

Examination showed that the recto-vaginal septum was represented by a thin, firm band, while the sphincter pits were easily felt, the condition being more one of tear of the septum than markedly relaxed outlet. The uterus was in anteflexion, the cervix in descensus, and the lateral structures unimpaired.

Operation (May 10, 1899) [Dr. Stokes].—The septum was repaired in the usual manner, and at the end of ten days the union was perfect and the patient had perfect control over the bowels.

CASE XII.—Mrs. P., age 32. Complaint, badly lacerated womb. The patient has been married eleven years and has had five children and no miscarriages. The first and fourth children were breech presentations, and both died during delivery. The patient was badly lacerated during the first delivery. The patient complains of some tenderness in the right side of the pelvis and of being easily fatigued on exertion. She has always had good control of the bowels, except on two occasions when there was a slight involuntary discharge of gas and fecal matter. The bowels, as a rule, are constipated.

Operation (May 20, 1899) [Dr. Kelly].—The sphincter was felt to be heaped up posteriorly, and a thin bridge of tissue was found in front of the anus. The repair of complete rupture of the recto-vaginal septum was performed by turning down the apron as in the case of Mrs. G., uniting the internal sphincter and septum with figure-of-eight sutures, after making the rest of the denudation in the usual way. The rest of the closure was completed in the ordinary manner.

1418 EUTAW PLACE.

PRELIMINARY REPORT OF TRANSPLANTATION OF THE OVARIES.[1]

BY

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(With four illustrations.)

In September, 1897, I began a series of experiments on the ovaries and Fallopian tubes of animals. Thirty animals have been operated on.

Series 1.—The first group had for its purpose the demonstration of the accepted biological fact that pregnancy may occur where there is no contact between ovaries and Fallopian tubes. In some varieties of sharks the ova are expelled near the diaphragm some distance from the termination of the Fallopian tubes. It has been observed, too, in the human species, that pregnancy may occur where there is one patent tube and a functionating ovary on the opposite side. I laparatomized three rabbits, removed their left ovaries, and ligated their right tubes. Chloroform was used. One animal died from the anesthetic, another from sepsis, the third lived. The following is its history:

October 3, 1897: Large, white female rabbit with red spots. The abdomen was carefully shaved and sterilized. The left ovary was completely removed and the right tube was firmly ligated with sterilized silk. The abdomen was closed with sterilized silk, through-and-through method being used. For a while the rabbit repelled the efforts of the buck at coitus. July 31, 1898: Ten months after the operation rabbit gave birth to one well-formed offspring. I carefully postmortemed the rabbit with the following results: The right ovary was large and functionating. There was no ovarian tissue on the left side. Injection demonstrated patency of the left tube and occlusion of the right.

Series 2. *Grafting Ovaries from One Part of an Animal to Another Part of the Same Animal or to a Different Animal.*—(*A*) The grafted ovary was simply sewed to the

[1] Read before the State Medical Society, April 20, 1899.

mesentery or broad ligament—serous surface to serous surface.

(B) A pocket was formed in the peritoneum or on the broad ligament and the raw surface of the ovary grafted into it.

Division A.—October 21, 1897: Gray and white female rabbit. Both ovaries removed. One was planted on the omentum, serous surface to serous surface. March 3, 1899: No pregnancy had occurred. Rabbit was very fat. Animal was killed and postmortemed. There was abundant subperitoneal fat in abdomen and pelvis. The tubes and uterus were small and atrophied. Fig. 1 shows condition of tubes and uterus. On the mesentery was found a small, pale ovary, uniformly
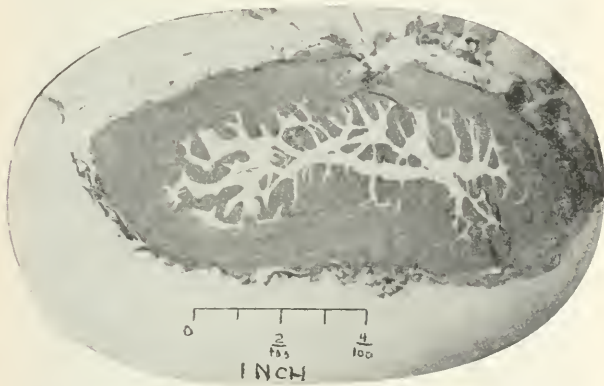
Fig. 1.

granular in consistence and presenting no maturing Graafian follicles.

Division B.—October 30, 1897: Large, gray female rabbit. Both ovaries removed. I planted the raw surface of one ovary in the denuded pocket on the right mesosalpinx. May, 1898: Seven months after the operation, rabbit gave birth to three well-formed rabbits. I postmortemed this rabbit. There was no excess of abdominal or pelvic fat. The uterus and tubes were large. The grafted ovary flourished on its new site. It was large and presented several maturing Graafian follicles. The dark corpora lutea were well shown.

You will notice, in Fig. 2, that the uterus is large and the tubes in no way atrophied. The ovary presents corpora lutea, but the Graafian follicles shrunk in the preserving fluid.

December 20, 1898, I castrated a large, white female rabbit.
I then grafted the ovaries of another rabbit, one into a pocket
on the broad ligament, the other into a pocket on the omentum.
Four months later the rabbit gave birth to five well-formed
offspring.   In this case we had successful pregnancy four
months after complete castration and transplantation from
another member of the same species.

SERIES 3.   *Transplantation of Ovaries from One Species
to Another.*—I have the complete history of one rabbit.   The
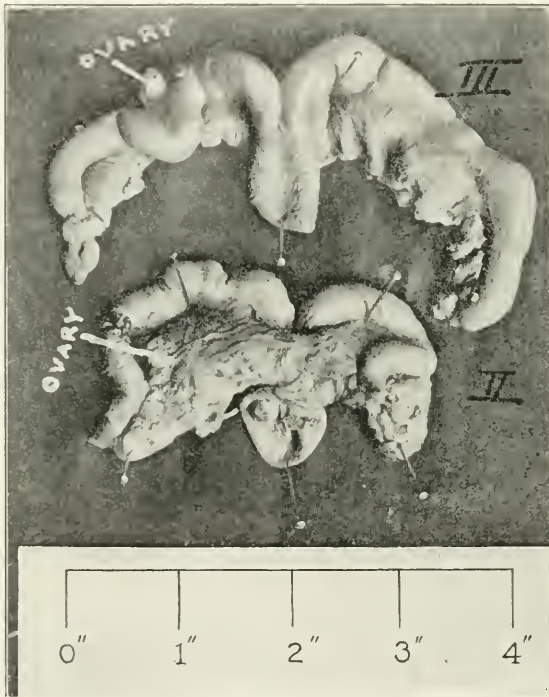
FIGS. 2 AND 3.

other animals are living and results awaited.   December 23,
1898, I completely castrated a large, black female rabbit.   I
then implanted the ovaries of a bitch, one in a pocket on the
mesosalpinx, the other on a denuded surface of the omentum.
Three months and a half later I postmortemed same rabbit.
The deposit of abdominal and pelvic fat was not excessive.
The uterus and Fallopian tubes were large and healthy.   Both
ovaries had continued to functionate, as was evidenced by the
healthy maturing Graafian follicles.   Fig. 3 shows the large

tubes and uterus of this rabbit, also the dog's ovary. Fig. 4, under the microscope, shows section of the ovary implanted on the omentum with the maturing healthy Graafian follicles.

Conclusions thus far Reached.—1. Contact between ovary and tube is not essential for conception.

2. Ovaries grafted from one part of an animal to another part of the same animal continue to grow, to functionate, and pregnancy can and does occur.
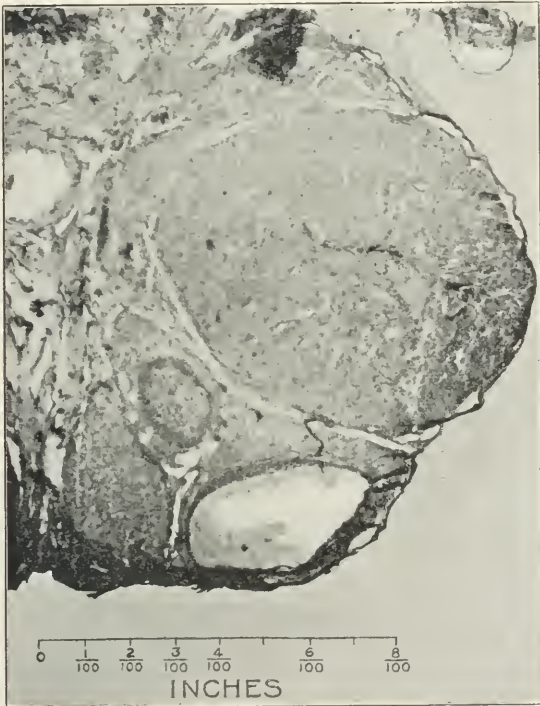
Fig. 4.

3. An ovary grafted from one animal to another of the same species continues to functionate, maintains the normal condition of tubes and uterus. Pregnancy can occur.

4. Ovaries grafted from one species to another continue to functionate, and seem to prevent post-castration atrophy of tubes and uterus.

5. Best results are obtained where the raw surface of the transplanted ovary is sewed to a denuded surface.

Practical Value.—This paper suggests conservation of

healthy ovarian tissue even on the opposite side from a patent tube. It indicates the possibility of grafting in the human species.

It proves that successfully planted ovarian tissue prevents the post-castration atrophy of tubes and uterus. The normal condition of uterus and tubes was maintained even when ovaries were grafted from one species to another. The grafting of animal ovaries may, therefore, be used in the human species to prevent the atrophy and post-castration nervous symptoms, etc. I purpose now trying to breed these animals, furnishing dog's semen to the rabbit with dog's ovaries and also rabbit's semen. I want to find out if ovarian grafting after atrophy occurs will restore the normal condition of tubes and uterus.

This paper had been a brief account of my personal work. I will briefly outline the work of others along similar lines. In 1896, in the *Centralblatt für Gynäkologie,* Knauer reported having transplanted ovaries from one part of an animal to another part of the same animal. He had four cases, and demonstrated functionating ovarian tissue microscopically some months after operating. In 1897, in the same paper, Grigorieff reported pregnancy after ovarian transplantation. In 1897 M. F. Jayle promised the Anatomical Society of Paris a report on ovarian transplantation, but has thus far published no report. In 1898 Knauer reported successful pregnancy after ovarian transplantation. Morris of New York, and Frank in Germany, have reported transplantation in the human species. Glass has also reported transplantation of ovaries in the human species.

1132 SUTTER STREET.

SOME NEW INSTRUMENTS TO FACILITATE THE OPERATION OF MYOMECTOMY.

BY

HOWARD A. KELLY, M.D.,
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(With two illustrations.)

IT is difficult to give adequate expression to the satisfaction I have felt for some years past in discovering that I was able to treat a large percentage of myomatous uteri by the enuclea-

tion of the tumors, leaving behind the entire uterus and so avoiding any mutilation.[1]

It has fallen to my lot in several instances to treat in this way young women who anticipated marriage; in a considerable number of other cases, young married women were childless and exceedingly anxious not to be deprived of the hope of offspring.

I have for this reason treated over a hundred cases by myomectomy and have long since adopted this operation as the operation of election within certain easily definable limits. I would therefore perform myomectomy, no matter what the number or site of the tumors, in all cases where the level of the myomatous uteri is below the umbilicus and in selected cases where the uterus rises well into the upper part of the abdominal cavity.

I would not do a myomectomy where the advanced stage of the patient made it useless, or where disease of the tubes and ovaries made the conservation of the uterus useless, or where the patient was so exhausted by hemorrhage or some complicating conditions as to make it imperative to complete the operation as quickly as possible.

Myomectomy is more dangerous than hysteromyomectomy and must therefore be performed with greater deliberation and with greater care in each step of the technique.

Myomectomy is more dangerous because in each case the operation must be individualized, while in hysteromyomectomy the operation has assumed more or less of a routine character.[2]

In myomectomy there is greater danger of hemorrhage because of the numerous vessels which it is necessary to control in the different planes of the uterine tissue, while in hysteromyomectomy the hemorrhage is controlled by the ligation of the four vascular trunks.

Myomectomy is also more dangerous than hysteromyomectomy because, while in the latter operation the tissues handled for the most part are those which are to be removed, in myomectomy there is a great deal of handling of tissues which are finally dropped back into the abdominal cavity.

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[1] "Conservative Treatment of Myomatous Uteri," Journal of American Medical Association, October 2, 1897. "Abdominal Myomectomy," Transactions of American Gynecological Society, vol. xxiii., 1898, p. 221; 90 cases.

[2] Fritsch: "Sind Laparomyomotomien typische Operationen?" Volkmann's Sammlung klinischer Vorträge. No. 241, 1899.

In performing a myomectomy I would insist upon the following precautions: In the first place, the hemorrhage must be checked throughout by using the necessary number of interrupted, serpentine, or mattress sutures, applied with particular care to the areas which are most inclined to bleed, in two or even three layers, from the bottom of the wound to the peritoneal surface; in the second place, to avoid the risks of increased handling, both operator and assistants must wear rubber gloves throughout the entire operation.

In doing so many myomectomies as have fallen to my share within the past two years, I have striven to facilitate the steps of the operation by devising two forms of instruments for the
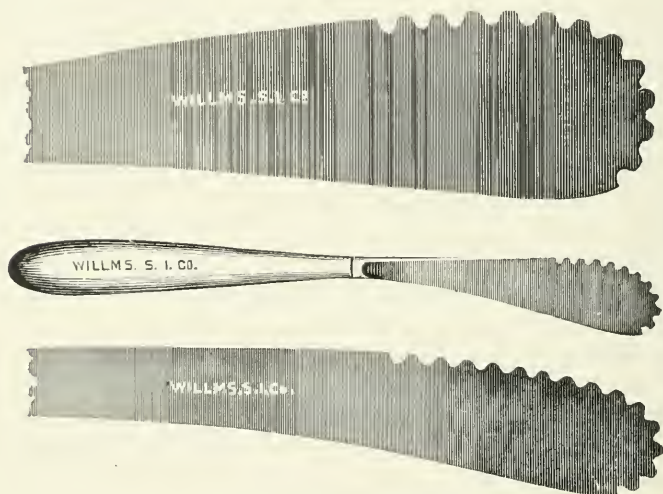
Fig. 1.—Myoma enucleator.

purpose of removing the tumors from their beds.   In a considerable number of cases I have used a spatula-shaped instrument devised by Dr. Cullen and figured in my "Operative Gynecology," vol. ii., page 359. I have recently devised a more satisfactory enucleator, which is provided with a stout handle affording a strong grasp to the fist, 12 centimetres long and 2½ centimetres wide, with a slightly curved blade 12 centimetres long, in the smaller instrument 1½ centimetres and in the larger 2½ centimetres wide.   The enucleating edge is serrated, the teeth in the larger instrument being eleven in number and at intervals of 0.5 centimetre, while in the smaller instrument there are fourteen teeth at intervals of 0.4 centimetre; in

either case the teeth are not pointed, but present a curved margin, while their edges measure 1 and 0.5 millimetres in thickness respectively. The forms of the ends are shown in the text and the instrument is shown reduced in size (Fig. 1). These instruments are used in the following manner: The uterus with the myomatous tumors is exposed and brought out, if possible, and surrounded with gauze. The uterine circulation is controlled either by a gauze rope or by the hands of an assistant grasping the cervix. The most accessible tumor is attacked first by making an incision boldly through the uterine wall and extending it sufficiently deep down into the tissue to expose the tumor perfectly, when it is grasped by a pair of Museaux forceps and pulled forward. Then with the enucleator, with its crenate margins and rounded teeth, the uterine tissues are rapidly stripped back and the tumor dissected out of its bed with a facility which is surprising. The crenations on the end

Fig. 2.—Myoma pick.

of the enucleator are beautifully adapted to catching the muscular fibres and rupturing them at their point of entrance into the tumor with a minimal amount of injury to the tissues. The larger enucleator is used for larger tumors, the smaller for those of medium size.

For little fibrous nodules from the size of a pea up to that of a cherry I have constructed a little myoma pick (see Fig. 2), which is plunged into the tumor and serves to lift it rapidly out of its bed while it is detached by knife, scissors, or small crenate enucleator.

The advantages obtained by the use of these instruments are the material shortening of the time of operation, the lessening of the amount of trauma, and, what is most important, the entire absence of any actual handling of the parts; besides which the entire tumor is removed without leaving any slivers or bits behind, as is often done where the knife is used for purposes of enucleation.

THE SURGICAL TREATMENT OF UNROTATED OCCIPITO-POSTERIOR POSITIONS.[1]

BY

HENRY D. FRY, M.D.,
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THIS subject is presented to the Society for discussion with the hope that some information may be brought out to act as a guide to the proper direction of treatment. The complication is of frequent occurrence and one which often brings death or invalidism to the mother and death to the child.

The short paper which I offer to-night is supplemental to one I read before this Society June 19, 1896, entitled " Manual Rectification of Faulty Head Positions," [2] the object of which was to emphasize the importance of recognizing and correcting faulty positions. Included in that was the consideration of the treatment of occipito-posterior positions which did not spontaneously undergo anterior rotation. I have frequently, since that time, had occasion to feel gratified by following the course there outlined, and I refer particularly to the success of artificial rotation with the aseptic hand introduced into the vagina under anesthesia.

The proper course to pursue in the class of cases which I now consider is not so clear to my mind. First, let me clearly define what that class is. I exclude those occipito-posterior positions which can be manually corrected, as already mentioned. I also exclude those which can be delivered readily by the forceps.

We have left persistent, unrotated occipito-posterior positions. The majority of these difficult cases are not met with in primiparæ, and I believe there usually exists in these cases some disproportion between the head and pelvic canal. The most common practice is to apply the forceps, and, in spite of the resistance offered, to overcome the difficulties by forcible and prolonged effort with the instrument. Delivery is often effected in this way at the sacrifice of the child's life and the integrity of the soft parts of the mother.

Such experience as the following is common: A woman

[1] Read before the Washington Obstetrical and Gynecological Society, February 17. 1899.

[2] AMERICAN JOURNAL OF OBSTETRICS, March, 1897, p. 345.

consults you, anxious and disturbed in her mind because she is pregnant for the second time.   Perhaps she wishes to have children, but nevertheless dreads the approaching confinement because of her former experience.   She gives the history of a long and tedious labor at the end of her first pregnancy, ended with difficulty by forceps and the extraction of a dead child. Her hopes had all been blasted, and, much as she longs for children, she fears a second experience.

You examine the woman and find a normal pelvis.   The conditions all favor a happy termination, and you assure her there is no reason for fear.   The case is watched during gestation, and it pursues a satisfactory course.

At the eighth calendar month you make an examination and find a vertex presentation with occiput anterior and the head readily engages in the pelvic inlet.   You renew your assurances of favorable indications for an easy labor, and the patient in due time gives birth to a living child without trouble.

Now, why is it the same woman has such widely different results in the two labors?   The explanation, in the vast majority of cases, I feel confident, is that in the first labor the difficulty was due to unrotated occipito-posterior position of the head.   The malpositions are often unrecognized, and, tedious efforts by Nature to rotate the occiput forward being ineffectual, they must be supplemented by artificial assistance.

Personally I can recall a number of cases similar to the hypothetical history mentioned.   Within a short time I delivered two women living two doors apart, and each had gone through with such an experience.   They did not know each other at the time, but a bond of sympathy drew them together and they have since met.

Mrs. A. was a young married woman, fond of children, and strongly wished for the joys of maternity.   Her first pregnancy came as a grateful blessing.   Her labor was long and tedious and finally terminated by the combined efforts of two physicians and a pair of forceps.   The baby was dead.

After the mother's recovery her physician informed her it would be impossible to give birth to a living child on account of deformity of her pelvis.   He emphasized the fact to her husband, and told him if he would go to the Army Medical Museum he would see there the skeleton of a woman with deformity of the pelvis similar to that which existed in his wife. Disappointment and unsatisfied yearning for motherhood led her to go to an asylum and adopt a child, which I later had

under my care for scrofula. To her horror she became pregnant again, and in her imagination death seemed staring her in the face. I measured her pelvis carefully and found it absolutely normal. Repeated examinations made in the latter months of gestation showed no disproportion between the presenting part and the pelvic inlet. She went to full time and was delivered by natural and easy labor of a living child. She is again six months pregnant.

The other case was very similar in its history. Her delivery was a still more difficult forceps case and she was attended by three physicians. Her baby was born dead; she was badly lacerated and made a slow recovery. She likewise feared a second pregnancy, as she had been told she could not give birth to a live child. Her second pregnancy and labor were normal and terminated happily.

Of many similar cases which I could recite I will mention but one more. A patient came to me from Virginia about six months advanced in her second pregnancy. She stated that her first pregnancy had ended by the delivery of a dead child. She was living near Lynchburg at the time, and described her confinement as having been an exceptionally severe one. It lasted a long time, and four physicians were in attendance, who finally succeeded in extracting the child with forceps. She and her husband were laboring under severe mental strain and dreaded the next confinement. He was a school teacher, a graduate of Johns Hopkins, and had made arrangements for the obstetrician of that institution to see her in consultation in case of difficulty. Measurements of the pelvis were normal. The case was sent to Columbia Hospital, and at full time was easily and naturally delivered of a living child.

These and other familiar examples show the influence over labor of favorable and unfavorable positions of the vertex. Failing to convert the one into the other, the forceps comes to our assistance.

In many cases delivery can be effected with it, but when undue force is necessary the disastrous consequences mentioned are liable to occur. In suitable cases podalic version offers a better substitute.

If the amniotic fluid has not been evacuated too long; if the uterine walls are not too firmly applied to the fetal ovoid; if the ring of Bandl is not distinct and too high; and, finally, if the head is not entered too far into the pelvic excavation, podalic version offers the hope of a favorable substitute. Even

when the head is in the pelvis it can be gently and safely pushed up under the relaxation of complete anesthesia. I have held the method in high favor and employed it successfully on several occasions, but a fatal termination in one instance led me to hesitate to accept it as a safe practice. I saw this case in consultation with Dr. Bowen. The patient was a primipara with R. O. P. position. The os was fairly well dilated, the membranes ruptured, the head in the upper part of the pelvic canal. Efforts to rotate the occiput with the hand failed. The forceps was tried, and all the force that could safely be employed was unsuccessful. Under complete anesthesia the head was raised, podalic version employed, and the child delivered. The mother died from shock a few hours later.

Sepsis, shock, and uterine rupture are the dangers to be kept in mind when employing podalic version.

Now the question arises, Are our resources ended with the methods of treatment mentioned? There are two others I wish to bring forward, one very old and the other recent. They are craniotomy and symphyseotomy. I wish to advance the claim of these in the treatment of cases of unrotated occipito-posterior positions which resist the usual methods and as substitutes for the forcible extraction with forceps. Let me repeat, the *forcible extraction*. By that term I mean extraction with forceps when it is necessary, in order to accomplish the end, to employ prolonged and violent efforts. Forceps used properly and with justifiable force do not come under this head. Many cases will terminate successfully when the instrument is applied advantageously. To insert the blades laterally will grasp the head obliquely, behind one ear and over the opposite eye, and prevent rotation either forward or backward. I believe this is a common cause of difficulty in the application of the instrument to the head in this position.

The choice between craniotomy and symphyseotomy will depend upon whether the child be dead or alive. If dead, it is much better to puncture the head, reduce its size, and deliver. This is far preferable to subjecting the mother to the dangers of the alternatives. Besides the risk of life, the slow convalescence and laceration of the soft parts are avoided. Failure to detect the heart sounds must not be accepted as a sign of the death of the child, as it is often difficult to hear them in occipito-posterior positions.

Before operating, the hand must be inserted into the uterus

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(under complete anesthesia) and the presence or absence of pulsations of the funis be determined.

An opportunity of this kind came to me in a case I saw with Dr. Henderson Suter. The patient was a primipara, the head was high, with the occiput posterior, and Dr. Suter had failed to effect delivery with forceps. I first made an effort with axis-traction forceps, but with no better success than he had met with. Having satisfied myself that the child was dead, I used Bar's modification of Tarnier's basiotribe and quickly accomplished the delivery of a very large child. With a living child I hold that we are not justified in destroying it to effect delivery.

Symphyseotomy here comes in as a safe substitute with a promise of saving the child and adding little risk to the mother. This calls to mind one of the most remarkable papers and discussions ever held in this Society. It was in the infancy of the organization, when our venerable founder and first president took the ground that craniotomy was never justifiable upon the living child. His position was assailed at home and abroad and led to the publication, in one of our most prominent journals, of an able but severely sarcastic criticism. At that time the revived symphyseotomy operation with its low mortality was not known. The only substitute for craniotomy was the improved Cesarean section, which had just begun to win the confidence of the profession. Through all the storm of adverse criticism Dr. Busey remained silent and waited for Time, the great arbiter, to set him right. He has lived to see the majority of the profession come around to accept views which he advanced ten years before their time.

NOTE ON THE VALUE OF BLOOD EXAMINATION IN GYNECOLOGY.

BY

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Cincinnati, O.

THE value of an examination of the blood in diseased conditions of the uterine appendages cannot be overestimated, and ts results are so certain that it becomes an important aid in

making a diagnosis. To say that a leucocytosis in a woman with pelvic pain always indicates suppurative disease of some of the pelvic organs is, of course, not true, for other conditions must be considered. A most careful physical examination should be made and a complete clinical history of the case obtained; and when then we are still in doubt, a blood count as a rule makes us positive and acquaints us with the conditions which confront us.

The relations of a normal or an abnormal temperature to pus tubes, and the relations of a leucocytosis to pus formation when a normal or an abnormal temperature is present, are equally interesting. Should a leucocyte count be made in a woman having an elevated temperature and acute symptoms with pus tubes, we, as a rule, find a leucocytosis of fifteen to twenty-five thousand leucocytes to one cubic millimetre. As the temperature becomes normal and the general health improves, acute symptoms subsiding, the leucocyte count will diminish to from ten to fifteen thousand per cubic millimetre. A leucocytosis of ten thousand per cubic millimetre or more in a woman with pelvic pain, after all acute symptoms have subsided, is—eliminating diseased conditions of the *blood* (*per se*) or of other organs by a careful physical examination and by a careful consideration of the clinical history—strongly indicative of suppuration of some of the pelvic organs. A leucocytosis in a woman with pelvic pain associated with fever of a septic or continuous type is of no great value in making a diagnosis of *suppurative* disease of the uterine appendages. A simple salpingitis (catarrhal), just as with a catarrhal appendicitis, will produce a marked leucocytosis, but after acute symptoms subside the leucocyte count will again become normal. In this condition a leucocyte count is of value, not as a means of determining the presence of suppuration, but as an aid in making a differential diagnosis. But should a leucocytosis continue after acute symptoms have subsided, then the presence of suppuration is almost certain.

Operators will say, " What good can be derived from a blood count when we can palpate the pus tubes and obtain a definite clinical history of some infection?" In these cases, of course, a leucocyte count merely assures us of the conditions with which we deal; but often a pus tube, dragged by adhesions to some abnormal region, feels like a fibroid or other tumor. The diagnosis of retroflexion or some other malposition of the uterus has often been made, and an operation resorted to in

order to relieve the patient from constant pain.   Upon opening the abdomen the malposition is found, but then only the true cause is revealed: some small pus tubes, probably thickened and bound down by adhesions, dragging the uterus from its normal position.   It becomes necessary to remove these diseased appendages, and had a leucocyte count been made it would have told of the disturbing element.   The differential diagnosis between typhoid fever and pus tubes in prostitutes, or in women where a history of some uterine infection exists, is at times extremely difficult, but the presence of a leucocytosis determines the latter and rules out the former.

Too much stress cannot be laid on the fact that all other conditions which might produce a leucocytosis must be considered—tuberculosis in many of its forms, abscess cavities in any other places, suppurative pyelitis, furunculosis.   A leucocytosis in chronic Bright's is very common, and there are many infectious diseases where its presence is associated with definite clinical manifestations.   There are cases with suppuration where no leucocytosis is present.   Cases in which the general health and state of nutrition is very low have no leucocytosis as a rule.   Cases of secondary anemia rarely show a leucocytosis.   Colored women who have pus tubes or pelvis abscesses seem to be especially subject to menorrhagia and metrorrhagia, and in such cases the red count is often reduced to half and the leucocyte count to about one-half of what we would expect.   In these cases, knowing the relation of the red and white count, we are not lost in making a diagnosis.

The methods employed in making a blood count are given in different text books, and admirably by Cabot.   The technique amounts to much, and a great number of counts must be made by an individual before they are worthy of consideration.

That blood work is still in its infancy there is no doubt, and its slow acceptance by many of the general practitioners and surgeons is due to the necessary tedious application in following what seems to be at first an indefinite pursuit, which, however, becomes definite and almost absolute when once we are familiar with the subject.

A NEW HANDLE AND GRIP FOR SCISSORS FOR PLASTIC AND OTHER DELICATE WORK.

BY

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Baltimore.

(With two illustrations.)

I HAVE often been struck, in common, I suppose, with other operators, with the awkwardness of the scissors which we have long been in the habit of using. The ordinary scissors present two serious disadvantages when called upon to do accurate work: in the first place, there is more or less motion imparted to both blades, which gives the cut surface the familiar zigzag
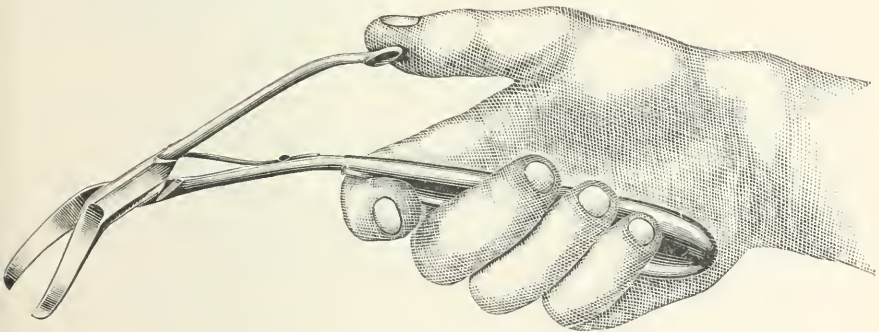
Fig. 1.—Scissors for plastic vaginal work.

outline; and in the second place, the manner of grasping the scissors is awkward, as the hand is held in a constrained position and more or less interferes with the inspection of the work as it is done.

In order to obviate these difficulties, I have made the following changes in the scissors of which I show two pairs in Figs. 1 and 2, designed for plastic vaginal work and for delicate work upon the bladder and ureters.

It will be seen that the new instrument is considerably lengthened, the pair with the Emmet blade curved on the flat being 24 centimetres long in place of 16.5 centimetres as usual.

The handle of this instrument is large and rounded, 13 centi-

metres long and 6.5 centimetres in circumference, and bent at a decided angle so as to take the operating hand out of the field of vision. The upper part of the handle has a thumb latch, which is twisted at an angle to the shaft so as to insure the shearing action of the blades. When in use the upper blade, connected with the handle grasped by the hand, is free from motion, while the lower blade, manipulated by the thumb latch, works up to it as a fixed point; in this way the cutting is done with accuracy and with far greater convenience.
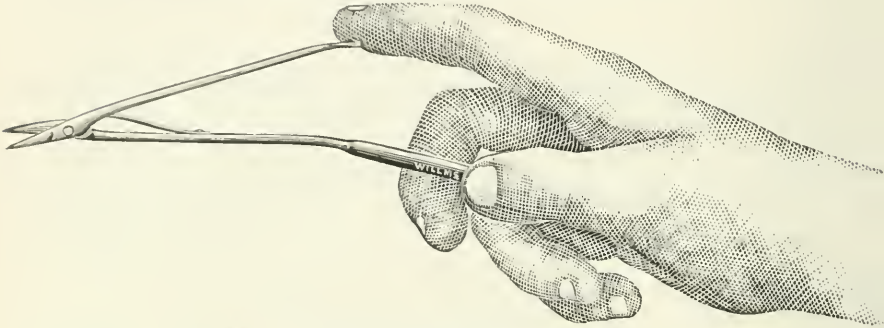
FIG. 2.—Scissors for bladder and ureteral work.

The little scissors used for bladder and ureteral work are made 21 centimetres long, so that they can be used with accuracy at a much greater distance from the surface than is possible with the ordinary scissors; they also permit of a much freer view and control of the field when grasped and used in the manner indicated in the diagram; the handle is held between the thumb and three fingers while the index finger works the latch as shown.

These instruments have been made for me by the Charles Willms Surgical Instrument Company, of Baltimore.

POSTPARTUM REFLECTIONS.[1]

BY

"CASEY."

My ma's perineum is ruptured,
  Her sphincter is torn right in two;
Now, maybe you think I enjoy it,
  But blamed if I think that I do.

[1] The Editor hopes his readers will pardon this lapse from the time-honored traditions of the JOURNAL. He believes that "a little nonsense now

With a face looking like a muskmelon,
   And an arm I hardly can bend,
I wonder now where in the mischief
   This circus is going to end.

The welcome I get on arrival
   Is not conducive at all
To the friendship I surely had hoped for.
   Simply because I can't bawl

They tie several knots in my navel,
   And stand me right up on my head,
Then spank my backside at their leisure
   Until it's quite painful and red.

They stick a glass rod up my anus—
   Objections are useless, they say;
They rub in my eyes silver nitrate
   Just because my papa once got gay.

And before I can make a suggestion,
   They fire me into a tub
That's as hot as the kitchen of Hades,
   And my guts half an hour they rub.

Then they cover me up in a blanket,
   They smother my mulberry head,
And leave me alone in my glory,
   Wishing, by gosh! I were dead.

I thought they were awfully hasty
   In stretching ma's cervix all day,
And when they had ruptured her waters
   I said they were getting too gay.

And then they must give her some capsules,
   Until she felt like a bean bag,
While her muscles contracted my topknot
   Until I felt like a wet rag.

and then" and a jolly laugh can do no harm, and so, in accordance with the fashion of the *Century*, he has given this "personal narrative" of an obstetric experience, delivered by Dr. Frank R. Oastler at the recent dinner of the Alumni of the Sloane Maternity Hospital, a place of honor as the first " poem " to be published in these pages.

Then as on the road I just lingered,
  Bidding farewell to my nest,
They started to hustle me onward,
  Though mamma was doing her best.

If they only had waited a moment,
  I'm sure there was plenty of time;
But no, they must stick to their orders,
  Obeying that classical rhyme:

" When more than an hour you've lingered,
  And the head has ceased its advance,
Why, forget what you're doing completely
  And hastily fall in a trance.

Put on the forceps abruptly
  Before the night senior gets there,
And yank out that head in a jiffy,
  No matter the size of the tear."

So as I was silently gliding,
  In accord with the curves of the way,
And peacefully waiting the moment
  To peek at the light of the day,

Quite roughly they grasped at my forehead—
  I fell like a thousand of brick
Right out on their tar-covered table.
  And now do you wonder I'm sick?

Do you wonder my navel is dirty?
  Do you wonder my stools are so green?
I'll wager that yours had been greener
  Had you been through what I've been.

You may laugh at the knobs on my forehead,
  And jolly my pineapple head;
You may say you can tell I am Irish
  Because my pug-nose is so red;

But you just allow the day senior
  To toy with your hide for a bit,
And I'll bet that you'll look like a lobster
  And once in a while have a fit.

Suppose you were stuck in a cradle
  Along with a bevy of brats
A-stooling, a-howling and spewing,
  Just like half a dozen sick cats;

And in order to get a day's fodder,
  Suppose you must suck a big tit
All smeared up with nitrate of silver—
  I guess you would kick just a bit!

Give back my moss-covered cavern,
  Give back my gill-breathing life,
Where, covered with sweet caseosa,
  I was free from this worldly strife!

Nourished without indigestion,
  Resting so calm in my pool,
Soothed by the murmurs around me—
  Ah, why did I leave like a fool!

'Twas there I kicked off no bedclothes,
  'Twas there I shook with no chill;
There was no one to pick at my navel,
  Most damnably 'gainst my will.

And what if I did spew a little,
  There was no one to wash out my gut,
Or shove a big tube up my rectum
  So high that I tasted the butt.

It's all very well to palaver,
  But you were not born at the Sloane,
Or else I will wager my diaper
  You hardly would grin in that tone.

Excuse me for telling my troubles;
  I'm not feeling happy to-night:
My buttocks are red as two cherries,
  My binder is awfully tight.

And then the cathartic they gave me
  Recalls to my mind the sad day
I ruptured my poor mother's sphincter
  In a most indelicate way.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

Joseph Taber Johnson, M.D., *of Washington, D.C., in the Chair.*

First Day—Tuesday, May 23.[1]

Dr. Charles P. Noble, of Philadelphia, read a paper on

THE HISTORY OF EARLY OPERATIONS FOR FIBROID TUMORS.[2]

Dr. Wathen said that when the monument had been erected to the memory of Dr. Ephraim McDowell, of Kentucky, Dr. Kimball had been present and had discussed the priority of deliberate work of this character. In the course of this conversation he had given at length his reasons for the belief that Atlee was entitled to the credit of priority.

Dr. Chauncey D. Palmer, of Cincinnati, said that in 1880 he had presented, in his initiatory address to the Society, a series of 165 cases and had found the mortality in this series to have been 51 per cent. About 80 per cent of these cases had been operated upon under the mistaken impression that they were ovarian tumors. It was not generally known that Dr. Thomas Wood, of Cincinnati, had been one of the very early operators on these cases, as he could testify, having had the pleasure of assisting him. At that time, fifteen or twenty years ago, this operator had been ignorant of the work of others in this field. He had not only been a pioneer in this field, but had been an exceedingly successful one. Neither the ovarian nor uterine had ordinarily been tied, but a ligature applied to the parts *en masse.*

Dr. Thaddeus A. Reamy, of Cincinnati, said that he had assisted Dr. Wood in several of these operations, and recalled the fact that Dr. Wood had operated with only the instruments found in his pocket case.

Dr. J. Whitridge Williams, of Baltimore, reported

A CASE OF SPONDYLOLISTHESIS, WITH DESCRIPTION OF THE PELVIS.[3]

Dr. E. P. Davis, of Philadelphia, said that he had seen in consultation a colored woman in obstructed labor. A forceps

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[1] Continued from p. 107 of July Journal.
[2] See original article, p. 171.   [3] See original article, p. 145.

delivery had been possible, but on compressing the uterus immediately after delivery the typical deformity of spondylolisthesis had been discovered. He had not seen this patient until labor and had had no opportunity of examining her critically either before or after labor. In that case there had been no history of traumatism. The speaker said that it was not uncommon, in examining a large number of women by pelvimetry, to find a considerable proportion presenting mild degrees of this deformity. The condition was evidently more frequent than had been supposed and was of congenital origin. Ordinarily the labors were not especially difficult. Statistics showed that vertex delivery of the fetus after symphyseotomy should be the rule, whenever possible, as version after symphyseotomy added greatly to the risk of severely lacerating the maternal parts. He had himself lost a patient after symphyseotomy with very much the same symptoms; instead of symptoms of a frank sepsis, there had been evidence of cellular necrosis and slow absorption, with perhaps finally the discovery of the presence of a considerable collection of pus.

REPORT OF THE COMMITTEE ON ANTISTREPTOCOCCUS SERUM IN PUERPERAL SEPSIS.[1]

Dr. J. Whitridge Williams presented the formal report of the committee.

Dr. Henry D. Fry, of Washington, D. C., another member of the committee, described his experience with the antistreptococcus serum during the past year. The local treatment in his cases had consisted in a preliminary cleansing of the uterine cavity, the curette not being used unless saprophytic germs were also present. Vaginal douches of hot sterile water or boric acid solution were given. The constitutional treatment had been limited to stimulating and sustaining remedies. The serum treatment had been begun as soon as the bacteriological diagnosis of streptococcus infection had been made. He had employed the serum in 8 cases. The temperature charts of these cases were exhibited, and on them were recorded not only the temperature changes, but the times at which the serum injections had been given, the quantities injected, and the times at which the curette or intrauterine douche had been used. The first case had received 100 cubic centimetres of the antistreptococcus serum, with a negative result. Hysterectomy had then been performed, and the right Fallopian tube near its uterine end found to be gangrenous and the seat of a perforation. The patient died a few hours after the operation. Cultures made at the autopsy showed an absence of streptococci.

In the second case there had been a pure streptococcus infection. A curettage had been done and then the serum injected. The woman had died the next day. At the autopsy a considerable quantity of pus had been found near the head of

[1] See original article in this Journal for September.

the pancreas, and cultures had demonstrated the presence of the streptococcus pyogenes and staphylococcus pyogenes aureus. In the third case a number of intrauterine douches had been given. In this case, as in the first one, the serum had at first seemed to act beneficially, but there had been in this instance also a return of the chills and of the fever. This patient had received altogether 140 cubic centimetres of the serum. It 'was worthy of note that in this case, as in some cases reported by others, the attendant upon the patient had developed a facial erysipelas. The use of the serum had promptly controlled this erysipelas. The fourth case had made a satisfactory convalescence. In the fifth case the presence of streptococci had been demonstrated before the elevation of temperature. This woman had received altogether 50 cubic centimetres of the serum. Her convalescence had been satisfactory. The sixth case had received 30 cubic centimetres of the serum and had also made an uninterrupted recovery. There was nothing of special note in the other two cases. In conclusion, the speaker said that in two of his cases the infection had taken place after abortion, and in six after labor at full term. Three of the patients had died and five recovered. Two of the fatal cases had been the result of infection after criminal abortion. The remaining fatal case had been one of acute sepsis.

DR. W. R. PRYOR, of New York, also a member of the committee, said that his work in this field had been limited to a review of the English literature, and this task alone had occupied two months. All cases had been excluded from consideration in which the existence of a streptococcus infection had not been demonstrated by proper bacteriological examination. He had adopted a special plan of treating these cases in his practice. It consisted, in the first place, in doing a thorough curettage; then evacuating all fluids in the pelvic peritoneal pouch; thirdly, in the isolation of the uterus by iodoform gauze packing; and, lastly, in securing the rapid absorption by the system of iodine through the lymphatics. Fifteen cases had been observed. On an average the presence of the iodine in the system had been demonstrated, by testing the urine, in five hours Intravenous saline infusions of from one to three quarts had been used to hasten absorption of the iodine. In testing the urine for iodine it had been found that the rise in the specific gravity was proportionate to the quantity of iodine present. The best test for iodine in the urine was chloroform and nitric acid. The presence of iodine in the urine vitiated Fehling's test for glucose. The examination of scrapings from the uterus had shown the complete absence of streptococci, but the colon bacilli had persisted in spite of the iodine treatment.

DR. FERNAND HENROTIN, of Chicago, opened the general discussion on the report of the committee. He said that the painstaking work of the committee had demonstrated the advantage of having a committee to investigate a subject of

this nature. He had personally been doing a reasonable amount of work in this line, using the antistreptococcus serum and taking the proper precautions in making the cultures for the bacteriologist. He thought most of those present would accept the conclusions arrived at by the committee at the present time. He would especially emphasize the statement that had been made concerning the bad results of curettage in these puerperal women. In his opinion it was an operation that was very often followed by bad results, not only because new channels of infection were opened up by it, but because of our inability to cover the whole ground. As a result of a large experience he had become convinced that women were tampered with altogether too much. Having once demonstrated the presence of a streptococcus infection, local treatment was unnecessary and most probably extremely harmful.

On motion of DR. HENROTIN the Society unanimously voted that this committee be continued in this field of investigation for another year.

DR. HENRY D. BYFORD, of Chicago, said that while it was proper to refrain from curettage, this did not mean that foreign matter should not be removed with the finger.

THE ABUSE OF THE CURETTE IN PUERPERAL FEVER.

DR. ROBERT A. MURRAY, of New York, instead of reading his paper on the above topic, made some remarks in connection with the discussion. He said that he also favored the examination of the interior of the uterus with the finger, in puerperal cases marked by an elevation of temperature, and the removal of foreign tissue instead of curetting. He described two severe epidemics of puerperal fever which had only been stamped out by adopting this plan of treatment. At one time repeated intrauterine douches had been substituted for the curetting, but with even worse results than before. It was a matter of common observation that the general practitioner, in cases of abortion, often introduced more germs by his method of curettage than had been present up to that time. In primary cases demanding curettage the treatment should be carried out under anesthesia to insure the requisite thoroughness.

DR. EDWARD REYNOLDS, of Boston, said that it was not very many years ago when the members of this Society had been enthusiastically in favor of the curette in the treatment of puerperal sepsis. That represented one extreme in the swing of the pendulum, yet he was inclined to believe that they were approaching the opposite end of the swing of the pendulum. Undoubtedly the curette had been abused, but it was very valuable nevertheless in a not inconsiderable number of cases. If the curette were used at all it should be with the greatest skill, intelligence, and thoroughness. To be used skilfully it must be under the guidance of ute-

rine touch. Ordinarily the fingers could be introduced into the uterus at the time of the curettage without employing general anesthesia. After light but thorough curettage the uterus should be cleansed and then let absolutely alone, for if the curettage had been well done there was no possible advantage in repeating it. In his opinion one could not curette too early in cases in which the lochia were foul and copious and the constitutional symptoms unimportant. He saw no objection to using the curette in those cases of streptococcic infection which were marked by slight constitutional disturbance as compared with the local manifestations, provided the curettage were done in the first twenty-four hours. The curette did harm in all cases in which the patient had been able to resist infection for a considerable time, for this fact was in itself evidence that Nature had raised a barrier against infection and that the increasing severity of the constitutional symptoms was dependent upon an extension of the infection to more distant parts.

Dr. A. H. Buckmaster, of Charlottesville, Va., said that while he believed it was objectionable to use the sharp curette, as had been done formerly, he favored the removal of pus-producing tissue from the uterus with the sterile finger. After that it was desirable to apply to the endometrium a mixture of equal parts of carbolic acid and glycerin.

SURGICAL TREATMENT OF ACUTE PUERPERAL SEPSIS, WITH SPECIAL REFERENCE TO HYSTERECTOMY.

Dr. H. N. Vineberg, of New York, read this paper in connection with the discussion. He defined *acute* puerperal sepsis as an infection taking place in, or shortly before, labor, and manifesting itself within the first week by symptoms of variable severity, and terminating in recovery, death, or the chronic form of sepsis. One argument, he said, that was brought forward against radical intervention was that so long as there was no general infection the patient would recover without operation, and that if such infection had occurred death was inevitable. There were some cases on record in which staphylococci and streptococci had been found in the blood and yet recovery had taken place. It was only after thorough bimanual examination and inspection of the parts that treatment should be instituted. In some instances it was proper to explore the uterine cavity under anesthesia, taking care not to carry up germs into the uterus. As to the propriety of curetting the uterus in cases of acute puerperal sepsis, there was a difference of opinion. Sepsis sometimes did not manifest itself until the eighth day, or after the cervix had contracted to such an extent that the use of the finger was impossible. Bonn's observations regarding the existence of the " granulation zone " or barrier against infection had been quite generally misinterpreted. Most of his cases had been quite mild and had recovered, whereas those in which the zone had

not been found or was only slightly developed had terminated in death, although curettage had not been practised. In Bonn's cases the infection had not always been saprophytic; some of them had been streptococci. Every conscientious operator would appreciate the difficulties of determining the indications for hysterectomy where puerperal sepsis could not be controlled by other means. If the pulse went above 130 and became weak and small, he believed, as a rule, that hysterectomy was indicated. Such a guide was certainly somewhat arbitrary, but it was as definite as could be deduced from the clinical practice of the present time. He did not depend upon the bacteriological examination, because it too often proved utterly unreliable in cases of puerperal sepsis. Moreover, the finding of the streptococcus in the discharges was no reason for looking upon such cases as necessarily very severe. He had practised hysterectomy successfully in three cases of puerperal sepsis. The first case had been severely criticised because the uterus had contained a considerable portion of placental tissue. He had curetted that uterus himself and had thought all of the placental tissue had been removed. The patient having given some indications of beginning peritonitis, he had operated and had removed the uterus. On cutting it open he had been astounded to find the placental tissue in one horn. Even had the cervix been patulous and he had been able to introduce his finger, the result would have been the same, because the retained portion was situated beyond his reach. The presence of the placental tissue was all the more remarkable because unattended with fetid lochia or the other ordinary signs of such a condition. It seemed to him that these cases should be operated upon through the abdominal incision, if only for the reason that hemostasis was more effective by this route than when the operation was done through the vagina.

His conclusions were: 1. Puerperal sepsis is wound infection, and wound infection in a woman's genital canal, as elsewhere, calls for free drainage, irrigation, and the removal of exudate. 2. In a given case of puerperal sepsis thorough search of the whole genital canal should be made. 3. If the source of the infection be in the uterus, curettage and irrigation and drainage should be employed. 4. In 95 per cent of the cases this treatment would be successful; for the remainder an exploratory laparatomy was demanded, and in most of them hysterectomy would be indicated. 5. When the pus collections in such cases were favorably situated no time should be lost in operating upon them; when not favorably located it might be desirable to wait some time.

Dr. A. Palmer Dudley said that as a surgeon connected with a very acute surgical service, in which two or three obstetrical cases were delivered every week right in the general wards of the hospital, he certainly felt sure that he saw a certain number of cases of streptococcus and staphylococcus infection. He had found in this service that the infective pro-

cess could be limited by the application of an ice-water coil to the abdomen. The process would thus be limited to the uterus, tubes, or pelvic peritoneum, if the cold were properly applied. Of seven cases of infection referred to, the septic process had not extended beyond these limits in one of them. In addition to this local treatment he had administered internally the bimuriate of quinine and urea. He objected to any manipulation of the puerperal uterus with the finger, for the fundus could not be reached except by dragging down or pressing down the uterus, and in doing this the broad ligament would be injured, as would probably be evidenced by the occurrence of a chill. The treatment should be begun by gentle curetting of the uterus, using for this purpose the irrigating curette. During the whole process there was a steady flow of very hot bichloride of mercury solution. The uterine cavity was then swabbed with carbolic acid. The heat secured good contraction of the uterus. Where the infective process had extended to the tubes he opened the cul-de sac and inserted drainage.

DR. T. A. REAMY said that it was impossible with the finger to explore the whole uterus one or two days after delivery at full term. It was a different matter in cases of abortion. It was absurd to attempt to introduce one's finger, which was of a certain length, into a uterus of an uncertain length. It seemed to him very unsafe, after the sixth month of pregnancy, to use a sharp curette in the uterus. One could not be certain that the curette was applied solely to the surface from which it was desired to remove tissue. He would protest against the recommendation of Dr. Vineberg that hysterectomy should be performed for the indications named by him.

DR. BUCKMASTER said that he could explore with his finger every square inch of the uterus in a woman delivered at term, without doing any harm whatever; moreover, he believed this was the proper method to pursue.

DR. H. J. BOLDT, of New York, said that the committee had correctly stated that a large number of cases of streptococcic infection would recover even without treatment; on the other hand, the mortality in these cases was great, although apparently just as great with as without the administration of the antistreptococcus serum. He had employed the serum in quite a large number of cases appearing clinically to be examples of severe streptococcus infection, but, as a rule, they had terminated fatally. The milder cases had recovered, but he suspected they would have done so just as well without the serum. If the serum were used early in the infection he believed it to be of benefit, but when used after the manifestations of puerperal sepsis had been thoroughly established it would not prove of avail. Regarding the question of curetting, he said that he was of the opinion that the curette was altogether too freely used by the profession generally. The profession at large had come to believe that this operation was

one which could be done by any physician without incurring
any special risk. He did not believe in curetting until the
finger could locate the tissue to be removed. When judiciously
employed by experienced hands he did not believe there was
any danger from the use of the curette. In one of Dr. Vine-
berg's cases it did not seem to him the operation of hysterec-
tomy had been justified; regarding the other two it was a
question of personal opinion. He was compelled to admit,
however, that he could not personally determine the indica-
tions for the operation. He had performed hysterectomy in
acute cases of sepsis with a uniformly disastrous result. It
might be different in the more chronic cases.

Dr. A. LAPTHORN SMITH said that in one case of puerperal
sepsis he had been persuaded to use the antistreptococcus
serum. He had administered thirty cubic centimetres, with a
very temporary reduction in the temperature. He had then
followed directions and had administered it three times a day,
with the result that the temperature had risen to 107° F. and
the patient had died. Up to six years ago he had used the
curette very little and had had but few deaths from puerperal
sepsis. Then he had begun the use of this instrument more
freely and had soon noted that there were more deaths. Act-
ing upon this hint, he had again largely discarded the curette,
with the result that the death rate had again improved. He
still used it, however, in cases of abortion. It was his practice
in all cases of sepsis to place the patient on a table under an
anesthetic and make a very thorough inspection of the genital
canal. Usually a great many wounds would be found. After
irrigation, to secure drainage, he twisted up a rope of iodoform
gauze and inserted a portion of it into the cervical canal.
Having introduced one ounce of boric acid and some *dry* tam-
pons into the vagina, he proceeded to repair the various lacera-
tions.

Dr. WILLIAMS, in closing the discussion on the report of the
committee, said that he was an absolute believer in the value
of bacteriological examination in cases of puerperal sepsis. He
had been repeatedly enabled to assure the anxious physician,
by such an examination, that the prognosis was much more
favorable than had been supposed. The curette should not be
employed in cases of streptococcic infection, although valuable
in the other cases. Clinical experience seemed to show that
hysterectomy was useless in *acute* cases of virulent septi-
cemia and was unnecessary in the milder cases. The opera-
tion, however, might find a place in a few more or less chronic
cases.

REPORT OF A CASE OF KRAUROSIS VULVÆ.

Dr. J. MONTGOMERY BALDY, of Philadelphia, in associa-
tion with DR. WILLIAMS, presented this report. He said that
the first symptom noticed was usually an intense itching and
burning of the vulva. The skin was frequently discolored

and small red spots appeared on the surface. Then a peculiar superficial shrinking of the vulva took place. The disease might be either unilateral or circumscribed. As it advanced, the labia minora became fused into the labia majora, the orifice became more and more contracted, and all sexual intercourse became absolutely impossible. Even after recovery from this disease the contraction of the vulva remained. The pathologi- cal examination of previous cases showed that the sebaceous glands had disappeared and that the sweat glands were almost entirely wanting. Here and there were small areas of round- cell infiltration. In the case just reported microscopical exami- nation showed atrophy in some and hypertrophy in other por- tions of the skin. The inflammatory action was slight. The outer layers of the corium were pale and slightly edematous, the elastic fibres being indistinct and deprived of their wavy outline. Small round cells were found in the large collections beneath the epidermis. In some places the corium appeared dense and sclerotic The etiology was still in dispute. Some had supposed the affection to be syphilitic, but the very fact of its rarity would seem to exclude this. From a review of their own case, especially from a consideration of the constant pru- ritus at the beginning, they had been led to believe that the cause was a local one.

DR. ARTHUR W. JOHNSTONE, of Cincinnati, said that the paper just read was a beautiful description of trachoma of the eyelid. He had studied the close resemblance of trachoma and kraurosis in a little group of cases of kraurosis that had happened to come to him in a period of about eighteen months. Some of these women had been in a horrible condition. Think- ing of the close resemblance of the condition to trachoma, he had applied yellow oxide of mercury, and, much to his delight, improvement had been very rapid. It was well known that, although the germs had not been isolated, trachoma was very contagious. In every one of his cases careful inquiry had elicited the fact that some member of the family had trachoma of the eye. A trachomatous eye would ordinarily tolerate a strength of ten grains of the yellow oxide to one ounce of vaselin, but he had not been able to find one case of kraurosis that could bear a greater strength than four grains to the ounce. His study of this subject had been published about four years ago under the title of " Trachoma of the Generative Organs."

DR. SETH C. GORDON, of Portland, Me., said that he had seen three cases of kraurosis One of them had followed the removal of the uterus and appendages; in the other two there had been no operation performed. In all three the vagina had been practically closed and the women had been from 35 to 40 years of age. In one case there had been an ulcerative process extending some distance up the vagina.

Second Day—Wednesday, May 24.

Dr. Howard A. Kelly, of Baltimore, presented a paper on

THE OPERATION FOR COMPLETE TEAR OF THE PERINEUM.[1]

Dr. A. H. Buckmaster said that he had operated by this method in at least twenty-five cases. Of this number there had been only two failures. The results, therefore, had been unusually favorable. He could see nothing in this method essentially different from that of Emmet, and the operation of the latter left no '' dead '' space.

Dr. Arthur W. Johnstone said that in 1886, when he had been studying with Tait, he had been impressed with the necessity for paying more attention to the plastic work. The method just described in the paper looked like nothing more than an awkward effort to carry out the principle laid down by Tait. He had been operating practically by this method since 1888 and had had only one failure, and that had been due to defective technique. The ends of the sphincter could be most easily brought together by rolling in the sides of the triangle with forceps and holding them in that position, with the rectum turned in upon itself, until the upper sutures had been tied, thus keeping the parts in the downward position.

Dr. Philander A. Harris, of Paterson, N. J., said that the apron which Dr. Kelly turned down seemed to him an entirely novel feature and one which, from a theoretical standpoint, had a great deal to recommend it.

Dr. J. M. Baldy said that one thing brought out in this communication was absolutely new—*i.e.*, the avoidance of a wound in the rectum. Dr. Goodell's old operation was to split the septum and turn it back; in the method under discussion the same principle was involved, but Dr. Kelly went into the rectum and turned down.

Dr. A. Lapthorn Smith described what he considered a simpler method of operating in very bad cases of laceration of the perineum. His main object in operating was to make two complete tubes of the rectum and vagina, and then endeavor to make the space between these tubes as great as possible. It seemed to him that many failures were attributable to the accumulation of gas, and hence he had adopted the plan of inserting a tube into the rectum.

·Dr. Thomas A. Emmet said that he looked upon the closure of a lacerated sphincter as one of the simplest operations in surgery, and he was sure that the surgeon should cure 95 per cent of his cases and in the other 5 per cent should discharge his nurse as incompetent. The reason a dead space was often left was that the operator did not denude far enough beyond the fistula. As the surfaces to be sutured represented two arcs of a circle, it was necessary to insert the sutures so

[1] See original article, p. 202.

that they radiated like the sticks of a fan. When assisting
Dr. Sims many years ago he had learned that the function of
the rectal tube, used at that time after these operations, was
not that of a tube, as a solid bougie would answer equally
well, but that the shape of the bougie secured the necessary
approximation of the sutured surfaces and hence promoted
healing. No matter how the sutures were inserted, if the
bowels were not moved daily by a saline cathartic a certain
percentage would necessarily fail. Nothing irritated him so
much as the advocacy of the "flap-splitting operation."
This splitting meant the invasion of the connective tissue
between the rectum and vagina. Such a method of operating
was an excellent demonstration of how *not* to repair such a
perineal laceration.

DR. ROBERT L. DICKINSON, of Brooklyn, N. Y., said the
sphincter ani consists of two separate muscles, joined behind

FIG. 1.   FIG. 2.   FIG. 3.   FIG. 4.
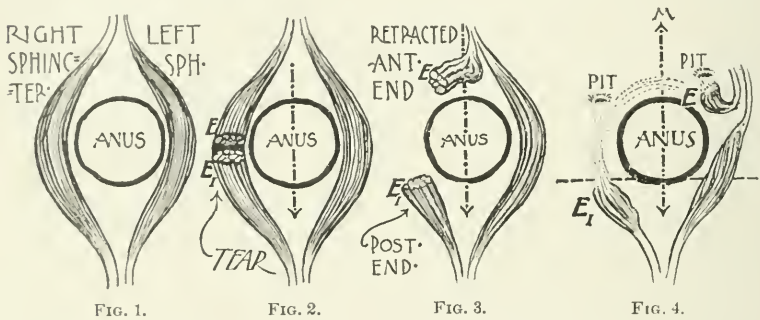
FIG. 1.—Diagram of the two parts of the external anal sphincter, being two muscles, a right and a left sphincter.

FIG. 2.—Typical laceration of the sphincter: the right sphincter has given way in the middle of its belly, 90° from the median line, or level with a transverse line through the anus (purely diagrammatic).

FIG. 3.—Retraction after laceration, as seen within ten days of labor.

FIG 4.—Retraction after laceration, as found many months subsequent to the injury. M, median line: E, E₁, retracted ends. E₁, though a part of the right sphincter, is to the left of the median line. E is below a horizontal line through the anus.

and in front, a right and left external sphincter. When a tear
occurs, it takes place either to the right or left of the median
line, very commonly at an angle of 90° to the antero-posterior
diameter of the outlet. The retraction of the muscle ends is a
very difficult thing to follow, and the result is one which puz-
zles us very much. When a tear occurs, the ends of the
sphincter retract much further than is usually imagined, the
short end toward the side of the anus and behind it; and the
other, with the perineal raphé, is at first anterior to the anus,
but later on to one side of it. It is difficult to identify the
ends of the torn sphincter in a late secondary operation.

The error in Dr. Kelly's beautiful picture (*Johns Hopkins
Bulletin*) is that for the operation he describes the pictured

dissection does not go deep enough.   It is often necessary to go on the coccyx side of the anus (laterally) in order to find the muscle fibres.   Often, even in recent injuries, the pit into which the short end has retracted is as deep as one and one-half phalanges.   The strength of Dr. Kelly's original statement is that, in his method of procedure, the length of the perineal apron is increased and fecal contamination of the wound is thus prevented.

The shorter muscle end is almost invariably behind (to the

Fig. 5.   Fig. 6.   Fig 7.   Fig. 8.
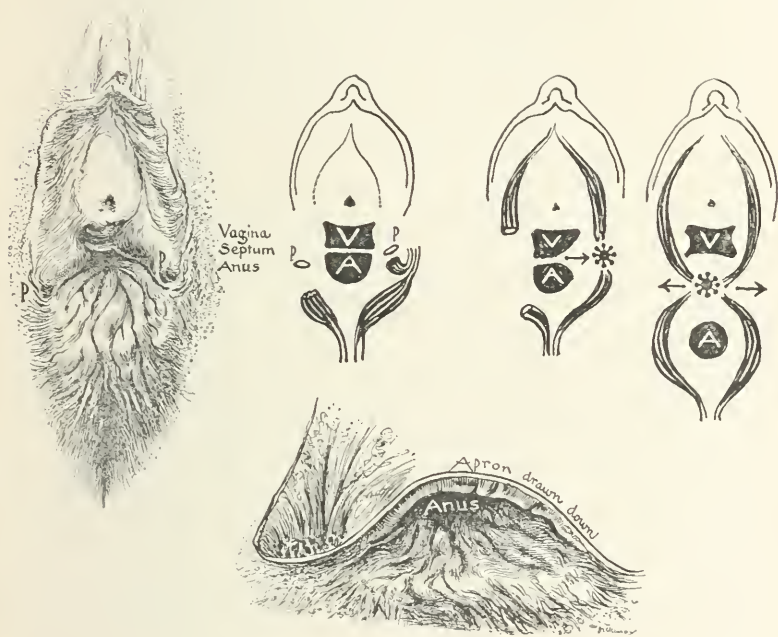
Fig. 9.

Fig 5.—Ancient complete laceration, the vaginal and anal openings separated merely by a septum. P and P stand close to the pits. Anus displaced forward by levator.

Fig. 6.—Diagram of the retracted sphincter ani muscles, in this case, the right having been torn. V, vagina; A, anus.

Fig 7.—Displacement of the perineal centre, shown by a star, toward the side of the intact sphincter.

Fig 8.—Diagram of the vulvar and anal sphincters, normally balancing the perineal centre, shown by a star. The arrows show the pull of the transverse perineal muscles.

Fig 9.—An attempt to show how far back toward the coccyx the muscle end must be sought. Even this does not exhibit a deep enough dissection.

coccyx side) of a line drawn transversely through the anus. From the pit, along the scar tissue, to the end of the muscle, may be an inch or more.

DR. W. E. FORD, of Utica, said that he looked upon Dr.

Kelly's operation as a distinct step in advance. He had by experience learned the necessity for dissecting down below the pit in order to find the muscle ends. The figure-of-eight suture was an especially valuable device, as it lifted up the anterior portion of the sphincter and did away with the dead space. One difficulty with Kelly's operation seemed to him the great danger of buttonholing the flap in the effort to turn it down.

Dr. I. S. Stone, of Washington, D. C., said that he had always found it very difficult to close the recto-vaginal fistula. It was important to dissect out the rectum thoroughly and draw down the mucous membrane, stitching it entirely over the field of the recto-vaginal fistula. He had practised the Tait method for a number of years and had been quite enthusiastic about it at one time, but he had eventually found that union had occurred with a considerable interval between the ends of the muscles. He now did Emmet's operation and found it entirely satisfactory.

Dr. H. T. Hanks said that the whole secret of success was to find and bring together the ends of the muscle and keep the bowels open from the first.

Dr. J. R. Goffe said that the cutting of the sphincter posteriorly was an exceedingly useful method of relieving the tension on this muscle. Instead of cutting through the mucous membrane, he divided the muscle underneath the mucous membrane. The same thing was done in operations for fistula in ano, and it was rare that the patients did not subsequently have perfect control over the passage of both feces and gas.

Dr. Kelly, in closing the discussion, said that it was perfectly possible for the sphincter to functionate even after having been cut. The apron was turned down, not to secure broader surfaces of approximation, but to protect the wounded surface from infection through the rectum. In this respect the operation differed very materially from the flap-splitting operation.

THE USE OF THE RENAL CATHETER IN DETERMINING THE SEAT OF OBSCURE PAIN IN THE SIDE.[1]

Dr. Howard A. Kelly also presented a brief communication on this subject.

Dr. Edward Reynolds said that he had derived the greatest satisfaction from an almost identical method of observation, carried out independently and in ignorance of Dr. Kelly's work. Instead of using the renal catheter and injecting through it a bland fluid, he had adopted the plan of giving the patient large quantities of water for twenty-four hours and then introducing the renal catheter and blocking it. In a short time the pelvis of the kidney became distended with urine and a renal colic was thus induced. A case was cited in which this method had furnished a striking example of its diagnostic value.

[1] See original article in this JOURNAL for September.

Dr. H. N. Vineberg remarked that with the patient in the knee-chest position and the openings of the ureters exposed, one could soon learn to pass the renal catheter with great ease and with comparatively little danger of infecting the patient. He thought the opinion had quite generally prevailed that this procedure was difficult and that there was great danger of infecting the sound kidney.

Dr. Kelly, in closing, said that Dr. Reynolds' method was an admirable one, but in it the precaution should be taken to use a rather large catheter, otherwise the kidney might not be blocked.

Dr. Joseph Taber Johnson, of Washington, D. C., delivered the President's address, on

CONSERVATIVE GYNECOLOGY.[1]

Dr. Henry C. Coe, of New York, read a paper on

CRURAL THROMBOSIS FOLLOWING CELIOTOMY IN ASEPTIC CASES.

Among the later complications of abdominal section for disease of the pelvic organs, there is none that causes more annoyance to the surgeon and disappointment to the patient than crural thrombosis. Occurring in simple cases in which a rapid recovery had been confidently expected, and at the end of the first or beginning of the second week when all anxiety regarding the condition of the patient has been dismissed, its appearance is as unexpected as it is unwelcome. One whose surgical training has rendered him sceptical regarding the development of post-operative thrombosis from general causes (anemia) at once thinks of local sepsis, his suspicions being strengthened by the detection of an induration in the broad ligament, or at the site of the stump, on the affected side, and he begins to review his technique carefully in search of some broken link in the chain. If other sources of infection can be excluded he is apt to infer that his catgut was faulty, since it is well known that the centre of the coarser sizes may be imperfectly sterilized and may not manifest its dangerous qualities until sufficient time has elapsed to allow the aseptic peripheral portion to become dissolved. Even though the bacteriological examination of the suspected piece is negative, it is impossible for him to dismiss the notion that there is a septic element in the case. Since there is, fortunately, no opportunity for postmortem investigation, he is obliged to base his opinion entirely on clinical evidence, which is itself largely negative.

That there is a general disposition to regard crural thrombosis following abdominal section as being purely of septic origin, and practically identical with the milder grade of puerperal phlegmasia dolens, once so familiar to obstetricians, is shown in the brief allusions to this complication in many text books and monographs. Kelly and Greig Smith, however, representing

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[1] See p. 1 of this JOURNAL for July.

the most advanced teaching in abdominal surgery, carefully
avoid using the word " sepsis " in this connection. The latter,
in the last edition of his well-known work, devotes only eight
lines to the subject of " Edema of the Legs," concluding with
this statement: " Most cases could doubtless be explained
by some traumatism or compression of a venous trunk in the
pelvis by forceps or ligature ; a few might arise from pelvic
cellulitis or angioleucitis."

This explanation is plausible, but far from convincing, since
it fails to account for the comparatively rare occurrence of
thrombo-phlebitis after total extirpation in bad pus cases, hys-
terectomy, myomectomy, and especially puerperal hysterec-
tomy, where there is always marked dilatation of the vessels ‧ f
the broad ligaments and mass ligatures and clamps are so freely
employed. Certainly, if traumatism played an important part,
the use of the angiotribe would seem to be especially favorable
to the development of this condition, which is not the case.

Welch, in a personal letter to the author, states that " femo-
ral thrombosis or phlebitis, occurring under the conditions
which you describe, is a very interesting subject, but I do not
think that the underlying causation is understood. I am
familiar with this class of cases, as several similar instances
have been observed here, particularly after gynecological ope-
rations, but also after other surgical operations on the abdo-
men, as for the radical cure of hernia, and indeed after surgi-
cal operations in general. In most cases there was nothing
to raise suspicion of any septic or infective condition before the
onset of the thrombosis, and then nothing but the thrombosis.
In at least one instance the thrombosis involved the veins of
an upper extremity. I do not know how well founded may be
the impression which I have seen expressed that this compli-
cation is more common now than formerly.

" Of late years some writers, particularly of the French school
(Cornil, Widal, Vaquez), consider practically all venous
thromboses, including those formerly called marantic, as infec-
tive, and it is true that bacteria have often been detected in
these thrombi. Still, there are not a few negative results in
examining the same class of cases, and I think that it is going
altogether too far to generalize on the observations thus far
collected and to assume that all these plugs are due to infection.
Some have thought that the frequent onset with chills, elevated
temperature, and rapid pulse indicated positively infection, but,
while of course suggestive of such an interpretation, I do not
think that these symptoms are conclusive upon this point.

" We have been examining bacteriologically, this winter, all
of the thromboses found at autopsy, and while several, perhaps
the majority, have contained bacteria, oftenest streptococci,
others have been sterile, so that I am not convinced of the
infective origin of all such cases as you describe. Take the
thromboses complicating chlorosis; these are often severe, with
chills, high temperature, etc., and still thus far (with one very
unconvincing exception) their bacteriological examination has
been negative.

"But I do not think that we can at present exclude infection in all these cases as the cause, and if we reject this explanation we should be quite at a loss for any other explanation. I am, therefore, inclined to the hypothesis that your cases and similar ones are due to infection; but at present this is only a hypothesis, and its foundation is mainly the difficulty of assigning any other probable cause. What is needed is an anatomical and bacteriological examination of the thrombi in these cases, and, as the termination is usually favorable, the opportunities for such examinations are necessarily rare."

The following cases occurred in the author's practice from May, 1898, to May, 1899:

Case I. (private).—Multipara, æt. 35, with excellent general health, but with a history of recurrent attacks of peritonitis and constant abdominal pain. Diagnosis, laceration of pelvic floor; retroflexion with adhesions; diseased adnexa. Operation May 19, 1898. Divulsion and curettement, colpo-perineorrhaphy, followed by removal of both adnexa and the adherent and diseased appendix, and internal shortening of the round ligaments. Adhesions slight, and no raw surfaces left within the pelvis. Separate ligation of the uterine arteries, excision of the tubes, and suture of the broad ligaments in the usual manner so that no stumps were left. Catgut used throughout. Convalescence normal, the highest temperature being 100.2° F. on the first day after operation. The patient began to complain of pain along the course of the left femoral vein at the middle of the second week. Well-marked induration was felt in the usual locality just below the groin, with slight edema of the foot and ankle. Pulse below 100, and temperature 99.5° to 100° F. No constitutional disturbance. Pelvic examination negative. Primary union of the wound.

The patient was kept absolutely quiet, but during my absence from the city for a day (on the twenty-fourth day) she insisted on being transferred to her home, which was only a short distance from the hospital, where she remained in bed for two weeks longer. Stiffness and edema persisted for two or three months, so that she was obliged to wear an elastic bandage, but she eventually made a perfect recovery and has since led an active life, taking long bicycle rides, etc.

Case II. (private).—Multipara, in good general health, æt. 30, sterile after six years of married life; suffering from severe dysmenorrhea and persistent pain in the right ovarian and appendical regions. Diagnosis, anteflexion with stenosis, disease of the right ovary and tube, and possibly of the appendix. Operation July 1, 1898. After divulsion and curettement the abdomen was opened, the right ovary and tube removed with the thickened and adherent appendix. Ligation with catgut, no stump being left. Left ovary and tube entirely normal. During the night following the operation (the weather being intensely hot) her temperature rose to 103° F., but without acceleration of the pulse or indications of local trouble. During the week which followed the thermometer was seldom below 90° F. in her bedroom, and she suffered greatly from the

heat in spite of ice bags and cold sponging. Her temperature was irregular, ranging from 101° to 102° F., but without any evidence of sepsis, so that no alarm was felt with regard to her ultimate recovery. On the fifth day she began to complain of pain in the left leg; a day or two later tenderness in the left groin on deep pressure was noted. By vaginal palpation a small, sensitive induration was detected at the base of the left broad ligament. The temperature declined steadily after the first week and soon dropped to 100° F., while there was at no time any marked acceleration of the pulse (it was seldom above 100° F.) or constitutional symptom.

The thrombo-phlebitis was quite obstinate, pain persisting for two weeks, though the edema was never well marked. The pelvic induration could not be felt after the second week. Primary union of wound. She left for the country five weeks after the operation, wearing an elastic bandage, but did not make a complete recovery until fall, when she reported in excellent condition. I heard through her physician, six months after the operation, that she was entirely relieved of her former pains.

I have never been able to assign a satisfactory explanation for the sudden primary elevation of temperature. Insolation was suggested as a possible cause. Fever developed too early for local sepsis and was too persistent for ordinary traumatic reaction. The patient was exceedingly nervous and restless, but I have never admitted "nervousness" as a cause of fever after surgical operations.

CASE III. (private).—Multipara, æt. 32; general health good. Pressure symptoms, dysmenorrhea and menorrhagia, and more or less constant pain in the right inguinal region. Diagnosis, small ovarian cyst. Operation November 3, 1898. Curettement, followed by removal of a cystoma of the left ovary the size of an orange, non-adherent. Right ovary and tube normal. Catgut ligatures and no stump. Appendix, the size of the thumb, removed and found to contain concretions, with marked thickening of its wall. Convalescence afebrile until the tenth day, when the patient began to complain of pain in the left leg. The temperature rose to 100° and fluctuated between 100° and 101.5° during the next ten days, the pulse seldom exceeding 100. Pain and induration along the left crural vein, but at no time was there any edema of the foot and ankle, merely a slight increase in the measurement at the calf. Vaginal examination negative. Constitutional disturbance limited to headache, coated tongue, diarrhea, and sleeplessness. Primary union of wound. The family physician came to the conclusion that the patient had developed a mild case of typhoid, which I doubted. The temperature became normal after three weeks, and she went home at the end of the fourth, wearing a bandage. She remained in bed for a fortnight longer, and called to see me two months after the operation, feeling quite well with the exception of some stiffness of the leg which prevented her from walking more than two or three blocks at a time. This soon disappeared, and she has since been in good condition.

CASE IV. (hospital case).—Virgin, æt. 40, a dressmaker, who had always enjoyed good health. She had a large ovarian cyst, which had undoubtedly existed for eighteen years (?) without giving rise to marked symptoms until within the past year. Operation March 4, 1899. Dermoid cyst, springing from the left ovary, entirely without adhesions, although it filled the abdomen and extended almost as high as the stomach and liver. Right ovary and tube normal. Catgut ligatures, with suture of the broad ligament in the usual manner. Temperature reached 100° only once, on the third day; pulse never above 90. Toward the end of the second week she began to complain of pain along the course of the left femoral vein. Moderate edema of the foot and ankle. Vaginal examination negative. No constitutional disturbance. Primary union of wound. The symptoms rapidly subsided, and the patient insisted on leaving on the twenty-sixth day, against advice. She remained quiet for two or three weeks and made a perfect recovery. I saw her on May 15, when she had no remains of the trouble except slight stiffness in the affected limb, which did not interfere with locomotion.

CASE V. (private).—Multipara, æt. 45, strong and well nourished. Had suffered for several months with menorrhagia, pain in the lower abdomen, and pressure symptoms. An eminent gynecologist had diagnosed uterine fibroid and advised hysterectomy. A fluctuating tumor the size of a grape fruit was felt to the right of and anterior to the uterus, which was enlarged to three or four times its normal size. Diagnosis, ovarian cyst.

Operation March 23, 1899. Divulsion and curettement, a small fibromyxomatous polypus and a quantity of fungosities being removed. Non-adherent cystoma removed from the right side and a commencing cystoma of the left ovary. No evidence of fibroid growths. Catgut ligatures, and no stumps left.

Convalescence entirely afebrile until the tenth day, when after a slight chill the temperature rose to 100° and the patient began to have pain at the origin of the saphenous vein. The pain was more severe than in either of the previous cases and was persistent, being only relieved by the constant use of an ice bag (which I have found is the best local application in this condition), but the temperature only once reached 102.5° in the evening, dropping to 99° in the morning. The pulse at no time exceeded 100, the average rate being 80, even when the temperature was elevated. Marked induration along the saphenous vein, with considerable edema of the thigh, but never below the knee. Mild constitutional disturbance. Vaginal examination showed a distinct, painful induration at the site of the stump, which could be traced outward to the pelvic wall. This disappeared in a few days with the use of hot douches (as in Case II.) while the crural phlegmasia was at its height. Convalescence was tedious, but the patient's general condition was excellent; she took plenty of nourishment, slept well, and preserved her usual equanimity. The tempera-

ture declined to normal at the end of the fourth week, when she was allowed to move to the lounge. As the pain returned (without rise of temperature) she was kept in bed for another week, and was not able to walk about her room until six weeks had elapsed after the operation. She went to church a week later, and is now (exactly two months after the operation) in excellent condition, though with slight stiffness of the leg.

Just after writing the foregoing my attention was called to a sixth case which seems to belong under this category.

CASE VI. (private).—Primipara, æt. 21, married one year, a well-nourished German, whom I saw for the first time April 6, 1899. She was delivered at term three days before. Labor had proceeded normally for twelve hours, when the head was arrested at the perineum, the pains becoming inefficient. The attending physician administered two drachms of ergot, soon after which the child was suddenly expelled with a violent pain; a half-minute later a second contraction occurred, completely inverting the uterus. The placenta was implanted centrally at the fundus, the cord being unusually short. The doctor peeled it off and attempted to replace the uterus, which was impossible on account of the firm contraction of the ring. The hemorrhage was profuse; the patient collapsed, became pulseless, and was only kept alive by saline enemata and hypodermatic stimulation. Twelve hours later her pulse was 180, and the following day it remained at 150 and was quite feeble. Forty eight hours after the accident an attempt at reduction was made under anesthesia, but she again collapsed, so that the manipulation was continued for only a few minutes. She was transferred to my service in the General Memorial Hospital seventy-two hours after the accident, having a pulse of 130 and a temperature of 101°, exsanguinated, with unmistakable evidences of sepsis. Under light anesthesia the diagnosis of complete inversion was confirmed, but no attempt was made at reduction on account of the necrotic condition of the endometrium and the patient's extreme weakness. Decomposed membranes and bits of placenta were removed, douches of pure peroxide of hydrogen and saline solution were given, and the vagina tamponed.

During the next two weeks the temperature ranged from 99° to 101.6°, the pulse varying from 90 to 120. Douches of peroxide and saturated solution of boric acid were used, at first every six hours, later twice daily. The patient improved rapidly, her recovery being retarded by several ugly abscesses on the arms and legs (a legacy of the accoucheur), which sloughed down to the muscle. She sat up on the twenty-third day and menstruated normally two days later without discomfort. On the thirty-second day after entering the hospital (the thirty-fifth since the accident) she was in good condition for operation.

Under anesthesia it was at once evident that reduction could not be effected by ordinary manipulation. Although the uterus was small (about the size of a Bartlett pear), the contraction ring was unusually tight. The abdomen was opened, and with

the able assistance of Dr. Jarman, after half an hour of hard work, the ring was stretched with the fingers and Wathen's dilator (the ends of which were guarded with rubber tubing), and we succeeded in replacing the inverted organ. The tubes, ovaries, and broad ligaments were perfectly normal, and there was no evidence of any obstruction to the circulation. As the round ligaments were greatly elongated, it was deemed advisable to shorten them by Mann's method. No reaction after the operation. Temperature on the following day 99.4°, and after the fourth day 98° to 99°, the pulse ranging from 80 to 90. Convalescence entirely normal up to the ninth day, when examination of the wound showed primary union. The same evening the temperature rose to 100.2°, the pulse being 90, and the patient complained of pain in the left groin and inner side of the thigh. It appeared later that she had felt slight pain the previous day, but had not alluded to it. Examination per vaginam on the following day revealed a tender cord which could be traced from the side of the uterus along the base of the broad ligament to the pelvic wall, where it was evidently continuous with an induration at the beginning of the saphenous vein. Uterus small, in normal position, and insensitive. No vaginal discharge. No edema of the limb. The evening temperature was 101°, the pulse 92. No constitutional symptoms. On the eleventh day the temperature ranged from 100.4° to 102.2°, the pulse being 112. Pain moderate and slight edema of the foot noted. On the twelfth day temperature 100.4° to 102°, pulse 106 to 112. Treatment, hot vaginal douches, ice bag, elevation of the limb, strychnine and quinine internally. Patient taking plenty of nourishment and presents no septic symptoms.

The patient's temperature fell to 99° yesterday, and she was free from pain, with every prospect of a rapid recovery.

I have few comments to add to these clinical notes. A rigid revision of the technique, both by my associate, Dr. George W. Jarman, and myself, failed to reveal any loophole by which infection could have crept in. Dr. Jarman himself assisted me in four of the private operations and personally attended to the sterilization of the instruments and field of operation. The nurse was not allowed to touch anything that came in contact with the wound. According to our usual custom, after thorough sterilization of the hands by the method employed at the Johns Hopkins Hospital, rubber gloves were put on, which were removed immediately before the operation and the hands again washed in alcohol, bichloride 1:1000, and saline solution. Neither of us had recently attended a septic case. The catgut, prepared by Levens, was regarded as above suspicion, and the tubes were sterilized with the instruments. In short, as the cases were important ones, every precaution was taken to insure a perfect result. The disappointment at the failures was therefore so much the keener.

Certain negative points should be emphasized. No foci of infection were discovered during operation. Mass ligatures

were not used, no stumps were left at the uterine end, such adhesions as were present were filamentary, and no raw surfaces remained within the pelvis; yet in three cases there was evidently thrombo-phlebitis of the veins in the broad ligament of the affected side, which, presumably, was continuous with the process in the crural vein. Curiously enough, in Case 2 there had been no lesion of the tissues on the left side, as the tube and ovary were normal. The pelvic indurations disappeared within a week, while the crural thrombosis was at its height, leaving absolutely no trace such as often persists for months in the case of inflammatory exudates surrounding silk ligatures and infected stumps. The patients were all in excellent general condition before and after operation, with no evidence of circulatory disturbance, so that the theory of marantic thrombosis is untenable. No traces of varicosities of the veins of the extremities or within the pelvis were noted. The bowels were moved daily after the third day in each instance. In none was there any disturbance of the stomach or any symptoms causing anxiety with regard to the ultimate recovery of the patient. Pain in the affected limb was the most marked symptom, and in all but one case it was sufficient to constitute a true phlegmasia dolens. Induration was present in all, but the edema was moderate, localized, and transient, leading to the inference that either the thrombi were parietal or that the collateral circulation was free. Recovery was rapid as compared with ordinary cases, even though the mistake was made of allowing the patients to leave their beds too soon. In only one instance did a chill occur, in only two was there the acceleration of the pulse on which Singer and others lay so much stress. In short, the clinical histories throw little or no light upon the etiology of the condition. Certainly the occurrence of six cases of this character within a year, in the comparatively limited experience of a single operator, must be regarded as unusual, if not unique.

In this connection I may be permitted to refer briefly to a case of crural thrombosis following trachelorrhaphy—a rare complication after this simple operation, considering the number of times that it has been performed and the septic infection (sometimes fatal) which used to attend it in the early preaseptic days. Why it should be so infrequent I do not know; in fact, I have never met with any allusion to it in the voluminous literature of Emmet's operation.

The patient (private) was a delicate subject, æt. 25, whose only labor had been rather severe, being terminated by forceps. Bilateral laceration of the cervix, with fixation of the uterus, due to a large cicatrix extending to the base of the left broad ligament; laceration of the pelvic floor. Operation January 6, 1898. Strict aseptic precautions were observed as in vaginal hysterectomy. Curettement, bilateral denudation of the cervix, the cicatrix on the left side being dissected out. Chromicized-gut sutures. Hegar's colpo-perineorrhaphy, with a continuous suture of chromicized gut within the vagina and a few

external sutures of silkworm gut. Convalescence afebrile and patient kept absolutely quiet for two weeks. Toward the end of the second week she complained of some stiffness in the left leg, but had no rise of temperature above 99 5°. A well-marked thrombo-phlebitis developed, with considerable pain and edema. There was tenderness on palpation in the left lateral fornix, but no induration could be felt. Primary union of perineal and vaginal wounds. The patient suffered from pain and edema for several weeks after the operation and could not walk without a bandage. Examination of the cervix at the end of a month showed excellent union, and nothing abnormal could be detected in the pelvis. It was at least six months before she experienced the benefit of the operation, and her example naturally deterred several of her friends from running the risk of a similar experience in my hands.

In the absence of any evidence of sepsis, and considering the anemic condition of the patient, I was inclined to believe that this was possibly a case of so-called anemic thrombosis, with which the operation had nothing directly to do. This view, however, is open to criticism.

The question of most practical interest in connection with this subject is that of prophylaxis. Is it possible to foresee and to prevent thrombosis after celiotomy ? Judging from the cases which I have reported, we are not yet in a position to give an affirmative reply. Wyder's and Mahler's cautions not to operate upon patients with weak hearts, varicosities, and edema of the lower limbs savor rather of *post-hoc* reasoning derived from observations in the dead-house. All surgeons operate under these conditions, yet the number of cases of thrombosis and embolism are insignificant considering the number of operations. Wyder's inference that the frequency of this complication must increase with the constant increase in surgical activity is hardly borne out by the facts. Certainly the mortality after celiotomy in the foremost foreign and American clinics has steadily decreased with the perfection of modern aseptic technique. Improved methods of operating and greater experience and manual dexterity have reduced the actual period of anesthesia and with it the number of deaths from shock, hemorrhage, and visceral complications. Sepsis is, and always will be, the one enemy which we have to fear. When we have succeeded in banishing it, at least from without, will thrombo-phlebitis be also eliminated in cases which are aseptic before operation.

The diagnosis of thrombosis confined to the pelvic veins, as shown by Wyder's cases, is practically impossible, but when combined with the crural variety (as in three of my own cases) it may be inferred from the presence of an induration extending along the broad ligament of the affected side. The recognition of crural phlegmasia after it has fully developed is so easy that even a tyro would not overlook it. But it has been affirmed that an expert should recognize the latent symptoms which appear in what Vaquez [1] calls the " preobliterating " stage.

[1] L'Abeille médicale, 1896, No. 53, p. 281.

Singer,[1] who has devoted considerable attention to a study of the pulse, claims that it is always more rapid than usual from the outset (that is, after the disturbance attending the operation should have subsided), and that after the seventh day the curve rises sharply, reaching its acme on the ninth day, when the local signs of obstruction appear, there being a direct relation between the pulse and the gradual development of thrombosis, with the consequent increased resistance to the circulation. In a typical case the curve rises rapidly while the temperature is still normal, and remains high after the latter drops. This peculiarity of the pulse (designated as *staffelförmiger* or *Treppenpuls*) is regarded by all recent observers as the most important, in fact the *only* early, indication of beginning thrombosis. It was most characteristic in the fatal cases of pulmonary embolism, so that its persistence and accentuation is regarded as somewhat ominous. Since it was not marked in my cases, I infer that they belong to a different type from those on which Singer based his conclusions—in fact, the phenomenon seems to be most marked in puerperal phlegmasia. It would seem to point to a septic condition, in the diagnosis of which it is well known that the pulse is often of more value than the temperature.

So far as my experience has gone, a slight elevation of temperature (99.5° or 100°) is most apt to attract the attention of the ordinary observer, and, in the absence of evidences of trouble in the wound or within the pelvis, to lead to the suspicion that phlebitis is developing. But careful questioning of the patient will often elicit the information that slight stiffness of the leg was noted before any other symptoms (especially pain) appeared.

The pain is often entirely out of proportion to the extent of the lesion. I do not know that it has ever been satisfactorily explained, unless we accept Simpson's view that it is caused by stretching of the walls of the vessel. The early notion that it was due to an accompanying neuritis he positively rejected.

Edema is nearly always present, though it may be so slight as to be appreciated only on careful measurement of both limbs. In this respect my cases presented a marked contrast to the phlegmasia attending puerperal and post-operative septicemia.

The prognosis in the class of cases which I have described is favorable as regards both a rapid recovery and complete disappearance of the local trouble. But the experience of the German surgeons whom I have quoted serves to emphasize in quite a startling way the fact that thrombosis following aseptic celiotomy is a complication which cannot be regarded with indifference. The sudden onset of pulmonary embolism in patients whose condition had not previously caused the slightest anxiety furnishes a forcible commentary on the uncertainty of the prognosis, as well as the absolute helplessness of the surgeon.

[1] Loc. cit.

In regard to treatment, it cannot be said that the usual local applications or general medication influence the course of the affection, either by limiting the extent of the thrombus or hastening its resolution. Absolute rest in the recumbent posture, without manipulation of the affected limb, although irksome to the patient, is the most important factor. We are apt to yield to her importunities and to allow her to sit up too soon. The disappearance of the local pain, induration, and edema, and the continuance of a normal temperature for several days, are usually regarded as indicative of complete recovery, but as long as the pulse remains at 90 or 100 it is well to err on the safe side and to keep the patient in bed for a few days longer. Singer even insists that the recumbent posture should be maintained for at least three weeks after the pulse has become normal. Although this caution may seem to be extreme, it will at least prevent a relapse with the attending annoyance to the patient, even though the risk of pulmonary embolism may be so slight as to be disregarded.

Dr. T. A. EMMET suggested the possibility of this thrombosis being the result of undue traction on the pelvic veins.

Dr. H. A. KELLY said that there could be no doubt that crural thrombosis might occur after the simplest as well as after the most severe operations. It was of practical importance to recognize thrombosis in three different positions in the body. The commonest was crural thrombosis, which, when well marked, could be recognized by almost any one. The elevation of temperature, the increased rapidity of the pulse, and the line of tenderness extending down the thigh pointed very clearly to the nature of the affection. In less marked cases the thrombosis could be diagnosticated quite early by careful measurement of the two lower extremities. Pelvic thrombosis was more likely to produce embolism and death than crural thrombosis. When, in addition to a slight elevation of temperature, the patient complained of a fixed pain on one side, he would strongly suspect thrombosis. He had seen two cases of a rare variety of thrombosis—i.e., thrombosis of the axillary region. He had at present such a case in his private hospital. The thrombosis had developed on the fifth week after a suspension operation. There was marked tenderness over the line of the axillary vein and some elevation of temperature, but there had been no marked acceleration of the pulse. The measurement of the arms showed a decided increase on the affected side. Absolute and prolonged rest was the important part of the treatment, and even after the patient had been allowed to get up the greatest care should be taken to prevent straining at stool.

Dr. W. E. FORD said that about two weeks ago he had lost a patient from embolism after a very simple operation for the removal of a small growth from the round ligament. At the time of operation he had noticed that the vein underneath the round ligament had been very large, and he had included it in the ligature on the round ligament. He had not made

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much traction on the round ligament. The wound had healed nicely and there had been very little rise of temperature. A few days later she had died suddenly with the usual evidence of pulmonary thrombosis associated with a slight convulsive movement. In another case the patient had expired suddenly about eight weeks after operation. A few days ago one of his patients had collapsed six weeks after an ovariotomy and had remained pulseless for two hours. In this case he believed there was a myocarditis, and suspected that the myocarditis had been present at the time of the operation. The patient had recovered.

Dr. A. Palmer Dudley reported a case of thrombosis occurring in his private hospital after a myomectomy and the removal of the tubes and ovaries. The operation had not been specially severe. The patient had had a very violent attack of pain and had gone into collapse, but had temporarily rallied. Death had, however, occurred during the night. He believed Dr. Emmet was right in suspecting that traction on the pelvic organs was often responsible for thrombosis. Another etiological factor, in his opinion, was a temporary pressure of artery forceps on the pampiniform plexus of the broad ligament. During the application of the forceps the circulation was interfered with, and on their removal he believed sufficient damage had been done to give rise to thrombosis.

Dr. H. D. Fry reported a case of sudden death from thrombosis following a hysterectomy. It had occurred to him that the case of axillary thrombosis referred to might have been due to the position of the arm over the head during the operation.

Dr. Hunter Robb said that within the past two months he had had a fatal case in which death had been supposed to be the result of thrombosis. The case was one of vaginal hysterectomy for complete prolapse of the uterus. She had apparently made an aseptic recovery from the operation, but on the seventeenth day, without any warning whatever, she had died. Fortunately a careful postmortem examination had been made, and this, much to his surprise, had revealed a large cyst of the arachnoid containing clear fluid. The cerebellum was exceedingly small, and other parts of the brain were lacking. In another case of sudden death that had come under his observation the autopsy had shown a cysto-sarcoma of the front part of the brain.

Dr. George Tucker Harrison, of New York, reported a case of crural thrombosis following the operation of laparomyomectomy. The thrombosis had made its appearance after the third week, and he had not been willing to admit that it had arisen from sepsis. By analogy it might be supposed to have resulted from what was known as "marantic thrombosis" associated with a weak heart. In this connection the speaker referred to the case of a lady who had developed a crural thrombosis immediately after having stubbed her foot against the stone pavement. The patient had gotten out of

bed too early, with the result that an embolic pneumonia had developed and had eventually caused her death.

Dr. Reuben Peterson, of Chicago, said that his experience had led him to think that the majority of these cases of thrombosis were the result of sepsis. He had formerly used silk for tying off the pedicle and had had a certain number of fistulæ. About two years ago he had substituted catgut for the work within the abdomen, and since that time, although he had used the same methods of hysterectomy and had made the same traction on the parts, he had had only two cases of thrombosis, and in these he had traced the source of the sepsis to imperfectly prepared catgut. He had had two cases immediately following operation in which the cause had evidently been a weak heart.

Dr. Malcolm McLean, of New York, said that one element in these cases had not yet been eliminated—*i.e.*, the personal element or idiosyncrasy. In the past twenty years he had observed thrombosis in patients in whom there had been such a family history. In two instances in which sepsis could be excluded crural thrombosis had occurred, and inquiry had shown that there was a tendency to thrombosis. In another case of crural thrombosis there had been no wound of any kind, and in this family also such a tendency had existed.

Dr. C. P. Noble said that the general tendency was to look upon these inflammatory processes as always septic, but his experience had led him to doubt this. He had had at least two cases of thrombosis following a hysterorrhaphy, and in these the theory of injury by clamps could be entirely excluded. He had seen it also in other cases in which clamps had not been used. In all of the cases of thrombosis in which he had been certain of the diagnosis recovery had taken place.

Dr. Wathen said that he had had one fatal case in which death had apparently resulted from embolism of the lung. He had done a celiotomy, wounding no structure except the abdominal wall, and making only a very small incision in that. As the case had proved to be inoperable because of extensive malignant disease, the wound had been closed without any manipulation. Everything had appeared to be entirely normal up to the fifth day, but at that time she had turned over in bed and within five minutes had expired.

Dr. George W. Jarman, of New York, said that he had seen most of the cases reported by Dr. Coe, and they had been minor abdominal aseptic cases, and he had been impressed with the fact that those who had discussed this paper had taken their illustrative cases from the same class. It was worthy of note that although he worked in the same hospital with Dr. Coe, had the same nurses, used the same material for ligatures and sutures, and adopted the same operative methods, he had met with only one instance of thrombosis.

Dr. Vineberg said that he would like to hear how the catgut had been prepared that had been used in these cases. His

reason for raising this point was the occurrence of most of Dr. Coe's cases about the tenth day, or about the time that the catgut dissolved.

DR. CUSHING, of Boston, said that his experience had been that thrombosis did not, as a rule, occur in the severe cases. He did not think these cases of thrombosis had anything to do with sepsis. They seemed to occur at a certain season of the year and in groups.

DR. COE, in closing the discussion, said that he had been impressed with Dr. Emmet's suggestion about the possible effect of traction on the pelvic vessels. It had also occurred to him that the interruption of the venous circulation by the Trendelenburg position might also have a bearing on this important topic. The catgut that he had used had all been prepared by the Levens method. He had not had any cases of thrombosis in aseptic cases up to one year ago, and yet six cases had occurred in these twelve months.

<div align="center">(To be continued.)</div>

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of February 17, 1899.

Vice-President WILLIAM P. CARR, M.D., *in the Chair.*

DR. H. D. FRY showed a tube ruptured by

TUBAL PREGNANCY.

The patient had been married two and a half years, never pregnant, menses regular. She was suddenly seized with abdominal pain and remained in bed several days; then she had another pain and a third one. Her appearance was as though she had had a hemorrhage; the abdomen was distended. He thought of ectopic gestation, but the vaginal examination was negative. The next day he examined her under chloroform, but detected no enlargement on either side; but he still thought it an abdominal pregnancy, for at this stage the ovum is no larger than a pigeon's egg. The abdomen was tense, and for a week the temperature ran between 99° and 100° F. The next week she began to flow, which lasted four days; then he detected a mass in the right side. She was sent to the hospital, and on opening the abdomen a pint of black blood escaped. There had been no symptom of collapse. The right tube was ruptured and the situation was such that the ovary acted as a ball valve, allowing hemorrhage to occur very slowly, which,

he thought, accounted for the absence of collapse. The blood was washed out and the abdomen closed. The temperature was as high as 101.4° F. during a few days, from a skin infection. Dr. Fry also showed a large

NODULAR FIBROID,

the uterus containing a fetus. The patient had a serious lesion, so that he hesitated to operate; but after keeping her in bed at home for three weeks and at the hospital for two weeks he opened the abdomen. He had thought to remove the tubes and ovaries and curette the uterus, but the ovaries were very adherent and a point on the tumor bled so profusely that he was compelled to remove the whole tumor. On opening the uterus afterward out popped a little fetus (two months). Convalescence was normal.

Dr. J. Wesley Bovée, speaking of the difficulty of diagnosis in some cases of ectopic pregnancy, said Dr. Fry's case had not presented a clear history of ruptured tubal pregnancy. Two symptoms are usually present, pain and the appearance of the loss of blood. In early pregnancy bimanual examination tells very little. The woman is tender and there is not much size to the fetus. Anesthesia reveals very little. A few days later the blood becomes roofed over by exudate and a mass may be discovered. Dr. Bovée thought the small size of the blood vessels, due to the early stage of the rupture, was the cause of the symptoms appearing so slowly, rather than the position of the rupture. Two months ago he had a case in a young woman who did not know she was pregnant. He had had her under observation for two years for a constant endometritis and retroversion. She would be in bed for two weeks with a slight flow. He had intended to curette and shorten the ligaments last summer, but, leaving the city at the time, he put off the operation. Last December she went over her time two weeks. She went to bed, and after two or three weeks she had a history of shock and some abdominal pain; the shock and pain occurred several times. He had examined her at his office some time before her last flow. Being called to her home after the above symptoms, he found a mass and some thickening posterior. He then made a diagnosis of ruptured tubal pregnancy. He removed the tube of the ruptured side and the tube and ovary of the opposite. In speaking of the condition of the heart in the fibroid case, Dr. Bovée said this organ seems to partake of the fibrous condition. He mentioned the case of a patient that had been at the Columbia Hospital with a similar heart. Dr. Forwood saw the case and said that ether would stimulate the heart so an operation might be done, which was the case, but it returned to the same condition after operation. Removal of the appendages in multiple fibroids does not accomplish such good results as in simple tumors. He thought this operation did no good whatever in multiple fibroids.

Dr. H. D. Fry read the paper of the evening, entitled

THE SURGICAL TREATMENT OF UNROTATED OCCIPITO-POSTERIOR POSITIONS.[1]

DR. J. WESLEY BOVÉE said there is no question but what a certain number of cases cannot be rotated by the hand. If we could be sure that the child is dead, craniotomy would be the operation as being least harmful to the mother; but it is difficult to tell if the child is alive, it being often difficult to hear the heart in this position. If the pelvis is large, the hand small, and the cord in a favorable position, the life of the fetus may be determined. He is of the same opinion as Dr. Busey: craniotomy has no place in obstetrics when the child is alive. There are men who will take the ground that Cesarean section is more safe than symphyseotomy. In those cases where futile attempts have been made to deliver with forceps, he thought Cesarean section the better operation. In most cases symphyseotomy is to be preferred. There are physicians who tell patients after a difficult labor that they must never become pregnant again, as it will cost them their life. These patients, if pregnant, want an abortion done, and it is hard to convince them that delivery may be safe.

DR. W. SINCLAIR BOWEN.—It is a great satisfaction to know that the head has rotated. He has had six cases of unrotated occiput—two in multiparæ, both having had easy labors before. With the " posterior position " the labors were long, forceps were used, and the children lost. Forceps were used in four cases: two children were lost and one mother. Two have since had normal labors. The pains in these cases differ from the normal: there is very little force, and after four or five hours very little progress has been made and the os dilated very little, though the patient seems to suffer a great deal. In the case reported by Dr. Fry the pelvis was large. She had been in labor forty-eight hours before the os was dilated sufficiently for forceps. The pulse was good at delivery. Hirst says forceps are required once in seven cases.

DR. WILLIAM P. CARR said he was surprised to hear Dr. Bovée speak as he did in comparing Cesarean section to symphyseotomy. He thought symphyseotomy was the operation for these cases. In his opinion there was no choice unless the pelvis was so deformed as to preclude the latter operation. He never considered symphyseotomy as dangerous as Cesarean section.

All the objections to symphyseotomy can be overcome. If the bones are wired they can be kept in exact apposition. It is unusual to have a separation of the iliac joint. He prefers this operation even in some cases where the child is dead. There is not so much shock. In his case, he believes if craniotomy had been done he would have killed his patient owing to the greatly swollen cervix.

DR. THOMAS C. SMITH said he was not prepared to agree with the essayist as to these operations in these cases. Cesarean

[1] See original article, p. 222.

section, to be successful, must be done under the most favorable circumstances, the patient being well prepared and not having been long in labor. Both Cesarean section and symphyseotomy call for a high degree of talent, and he was sorry that Dr. Fry had not offered something for the general practitioner. Dr. Smith had had a large number of cases. He sometimes lost the child, but has never lost the mother. He has been able to effect rotation, but failed to keep it rotated. He cited a case in which the waters had broken before dilatation of the cervix. The position was right posterior. Forceps were applied and delivery effected without injury to the mother. In one patient he had seen posterior rotation three times, and forceps were used each time. Dr. Smith spoke of a face presentation: there was good dilatation. The head would not come down in the pelvis. He changed the face to an occiput, but it would not stay. He turned, but lost the child.

Dr. H. D. Fry said he had been so satisfied with manual rotation of the head that he thought it would always accomplish the desired end. If you can feel the anterior fontanelle you know you have not good flexion and the head will not rotate. If rotation does not take place the patient should be etherized, the hand introduced, and the head rotated. The old instrument (the vectis) is of no use. Something may be accomplished by position of the patient. The Trendelenburg may be tried. Dr. Bowen is right as to the slow progress and the great suffering. The same kind of pains occur in breech and face presentations. There is one normal position, in which the presenting part touches the pelvis all around. The diagnosis of fetal life by introducing the hand into the uterus under anesthesia and feeling the funis is easy. Dr. Fry related the history of a case in which the funis was pressed on by the head so that there was no pulsation. He went to his office to get craniotomy instruments, and, on returning, the funis had escaped and was pulsating.

No one would uphold us in doing a symphyseotomy with a dead child. Craniotomy is as easy to do, and there is less shock and less injury; indeed, it is as easy and quick as a forceps delivery. He did not see how Dr. Smith could deliver all these cases with forceps without injury. He considered it work of a higher class to deliver such cases with forceps and not injure the patient than by his method.

REVIEW.

Twentieth Century Practice. An International Encyclopedia of Modern Medical Science. By leading authorities of Europe and America. Edited by Thomas L. Stedman. M.D., New York City. In 20 volumes. Vol. XVI. New York: William Wood & Company, 1899.

This volume opens with a valuable chapter on lobar pneumo-

nia by Andrew H. Smith, who defines the condition as "an acute disease in which a specific parasite invades the air cells of one or more pulmonary lobes, where it grows in a fibrinous medium exuded from the functional capillaries, and generates a toxin that infects the system at large." Following the idea expressed in this definition, his treatment includes: 1. An attack upon the pneumococcus through the medium of the blood, the object being that the exudate when it escapes into the air cell shall be impregnated with a substance that will unfit it to serve as a culture medium. 2. Stimulation of the emunctories to throw off the poison as it is formed. 3. Sustaining the vital power and particularly the heart—cardiac stimulants. 4. Relieving the pulmonary circulation—vaso-dilators. 5. Compensation for loss of respiratory surface—inhalation of oxygen. 6. Reduction of excessive temperature—cold to surface. 7. Relief of incidental symptoms. In regard to the pneumonic antitoxin, he says of the results obtained up to the present time that " they can scarcely be said to amount to more than an encouragement to further effort." Popoff, of St. Petersburg, contributes a well-written section on relapsing fever. The etiology and general pathology of typhoid are well discussed by John S. Thatcher, pathologist to the Presbyterian Hospital, and symptomatology and treatment by John Winters Brannan. Other chapters take up dysentery, cerebro-spinal meningitis, yaws, erysipelas, inflammation, and simple continued fever.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Sterility in Women.—A common form of sterility is discussed by C. Lefèvre.[1] The lesions combined in this class of cases are cervical catarrh and endometritis, false or true conicity of the cervix, stenosis of the external os, acute anteflexion, and marked posterior colpocele. The writer urges radical treatment of these conditions by gradual and repeated dilatation to correct the flexion and stenosis of the cervix, curettage and plastic operations upon the cervix, and partial colporrhaphy to prevent the recurrence of flexion and restore the natural size of the vagina. Of 49 cases so treated 8 were lost sight of, 10 failed for reasons not depending upon the therapeutic measures. Of the remaining 31 cases 24 were successful, about 79 per cent.

When may a Puerpera Leave the Bed ?—Charles[2] followed the advice of Küstner, who permits women to leave the bed three days post partum, claiming that this aids the involution of the uterus. The author, who is physician-in-chief of the Maternity Hospital in Lüttlich, substantiates Küstner's statement. He remarks, however, that it would not be advis-

able in general practice, because the women, although out of bed, must abstain from all work and exertion.

According to *Küstner*,[5] a woman may leave the bed on the fifth day, not only without harm, but often to great advantage. Involution is more perfect, the lochial discharge decreases, and there is no increased danger of prolapse. It facilitates the evacuation of bladder and rectum and diminishes the liability to flatulency. The abdominal walls sooner regain their firmness, and cardiac depression is less marked than after prolonged rest in bed. After abnormal confinements and obstetrical operations the period of rest should be extended. *Olshausen* emphatically disapproves of Küstner's advice and draws attention to the fact that the wounds which more or less accompany every confinement are apt to reopen. The uterine ligaments at this period have also not undergone sufficient involution and the woman is more liable to incur uterine displacements. He cannot comprehend that leaving the bed on the fifth day should tend to make the abdominal walls more tense, and believes that the weight of the intestines favors the liability to a pendulous belly. It is also likely to have an unfavorable influence upon the circulation, because the dilated veins are likely to remain enlarged. *Schatz* states that the distended pelvic floor best regains the normal condition by prolonged rest in bed, and can see no reason for permitting the puerpera to leave her bed thus early.

Expression of the Placenta, a Modification of Crede's Method.—Budberg[3] publishes a modification of Credé's method, employed in the Dorpat Maternity Hospital, which has been found successful in about 1,000 cases. While conversing with the patient, to divert attention, the right hand is placed over the uterus, the thumb pointing forward, the forefingers grasping the fundus posteriorly. The left hand, placed above the symphysis, grasps the uterus anteriorly. During pain both hands make firm compression. This is usually followed by expulsion of the placenta. Should the placenta not come away the hands are not removed, but left *in situ* awaiting the next contraction, during which the maneuvre is repeated. If, owing to the thickness of the abdominal wall, the uterus cannot be felt, Budberg advises inserting the middle and index fingers into the vagina, and, seizing the anterior or posterior lips, steadying the cervix by forcing it against the symphysis. The right hand grasps the uterus as before and compresses the organ during a contraction. With the exception of absolute adherence, this method was always successful.

Puerperal Hyperpyrexia.—J. Lamond Lackie[4] describes a case of this variety in which the temperature on several occasions was as high as 110° and once reached 112°. On the occasion when the temperature reached 110° he packed as much ice over the surface of the body as possible; but when the temperature went up to 112°, besides the ice treatment he gave twenty grains of antipyrin per rectum and an antiseptic douche which washed away a large slough and a quantity of

foul-smelling discharge. The temperature gradually fell to normal. This was a case in which the ptomaine poisoning from autogenetic infection was so great that on three successive nights the patient had marked hyperpyrexia. He draws special attention to the one symptom which he had the opportunity of observing on the third day, and which indicated the threatening onset of hyperpyrexia: it was the peculiar restlessness, especially of the eyes, and the deceptive expression of " well-being " on the part of the patient.

Pathogenesis and Prophylaxis of Puerperal Fever.— *Ahlfeld* opened the discussion and stated that he diagnoses every rise of temperature occurring during the puerperium as puerperal fever until it is proved to be non-puerperal. Puerperal infection is due to external sources and to autoinfection. Internal examinations after disinfecting the hands with soap and water and alcohol are free from danger; he disapproves of the wearing of rubber gloves. After operative confinements Ahlfeld advises repeated disinfection of the vagina. He also believes a preliminary vaginal douche of decided benefit. *Bumm* says childbed fever is a surgical fever. We must differentiate between wound intoxication and wound infection. Saprophytes, with which Bumm also classes the bacterium coli, decompose the wound secretions and are found only on the surface of the decidua. The streptococcus produces wound infection and enters the deeper tissues through the endometrium near the insertion of the placenta. Besides streptococci the staphylococcus aureus and albus may cause puerperal fever. Bumm also observed a case of fatal puerperal infection due to pneumococci. In this case pneumococci were found in the uterine vessels and in the lochia. The next question discussed by Bumm was, whether the vaginal secretions are infectious and the vagina of the parturient should be disinfected or not. His investigations have proved that the streptococcus pyogenes and staphylococci do not occur in the normal vagina. As to the merit of prophylactic douches, Bumm remarks that in his clinic they are not administered, nevertheless the mortality is no higher than in institutions in which the douche is the routine. Bumm believes that puerperal infection is always communicated from the outside, and therefore our aim must be to sterilize everything which comes in contact with the woman's genital tract. His experiments have shown that it is almost impossible to sterilize the hand, and he advises the wearing of protective rubber gloves. *Döderlein* considers that Ahlfeld is mistaken in being able to render the fingers aseptic by disinfection with soap and water and alcohol. Cotton gloves worn next to the skin are rarely sterile, but the germs found are not from the air but the operator's hands. Permanganate of potash and hydrochloric acid render the hands aseptic; and they remain sterile while dark, but as soon as the hands become lighter in color the germs again make their appearance. Döderlein examines only with rubber gloves; since their adoption (about one year) the percentage of nor-

mal puerperia has decidedly increased. *Fehling* denies that a healthy puerpera who has not been examined has ever died from puerperal fever. Puerperal infection may originate in any portion of the endometrium, and not only from the placental side as believed by Bumm. During vacation, when the students do not attend the clinic and internal examinations are dispensed with, the morbidity at his clinic decreases 5 to 10 per cent. Fehling found that during the time when sterilized cotton gloves were worn over the hands the morbidity increased instead of diminished, and for that reason they were discontinued. He also disapproves of the prophylactic douche, and states that in his experience douching increases and does not diminish the liability to puerperal infection. Puerperal infection occurring in women who have not been examined should be termed secondary infection; it is not autoinfection, as believed by Ahlfeld. *Krönig* points to the fact that all known methods of hand disinfection are uncertain. He believes that saprophytes possess the power of invading the organism and producing even fatal puerperal fever. *Prochownick* made blood cultures in every puerpera suffering from fever. Most of these cultures were sterile, but in four he found streptococci. In such cases the prognosis is very bad and the extirpation of the diseased uterus is advisable. *Hoffmeier*, contrary to most bacteriologists, believes that the normal vaginal bacteria may enter the uterus and produce septic infection. He advises thorough disinfection of the vagina prior to every obstetric operation. *Zweifel* states that years ago he emphasized the fact that all methods of disinfection of the hands are uncertain and insufficient, and for this reason the obstetrician should abstain from handling septic material. *Küstner* says that rubber gloves do not render examination more difficult. Their use, however, does not obviate the necessity of a thorough disinfection of the hands. *Werth* has never seen a case of infection which could be traced to hands thoroughly disinfected, and for this reason thinks it unnecessary to wear gloves. *Rosthorn* advises the wearing of rubber gloves when making an examination or handling septic material; they are uncomfortable during operation. He observed cases in which the typhoid bacillus produced puerperal infection. His experience with serum treatment was not a very fortunate one. *Schatz* states that in his experience a sore throat or other infection distant from the genital tract has caused serious puerperal infection. *Franqué* believes in the possibility of autoinfection and that prophylactic douches are required. *Olshausen* approves of prophylactic douches and disinfection of the vagina before operation.

Puerperal Sepsis.—James D. Voorhees [6] has published the notes taken in a case of puerperal sepsis which occurred in the service of Dr. E. B. Cragin at the Sloane Maternity Hospital. He states that nine injections of antistreptococcus serum were given, with no good results, but yet without harm. The serum was given up and inunctions of unguentum Credé given.

After these inunctions the patient began to improve; she was hungry and more rational. The inunctions did not prevent complications, but undoubtedly fortified the patient and increased her resistance so that she managed to survive them. There were sixty-eight inunctions in this case, of a drachm each. The Schering & Glatz preparation of the unguentum Credé was used. There was no depression, no albumin in the urine, no argyria, and there were no poisonous or bad symptoms from its use. The ointment is not a remedy for all cases of sepsis. The preliminary curettement of the uterus, the frequent douching as long as the discharge is profuse and the uterus is not draining well, the forced feeding, and the vigorous stimulation must be used with good judgment at the beginning of the infection and during this method of treatment. This case was protracted and the patient was in a severe pyemic condition, but she made a good recovery after two months' illness.

Adherence of Membranes to the Cervix an Important Cause of Tardy Dilatation of the Cervix.—Adherence of the lower pole of the ovum to the cervix delays the unfolding of the cervix and prevents the descent of the membranes and dilatation of the internal os. Löhlein [7] has recorded a number of observations in which this condition has delayed the first period of labor and produced what is commonly diagnosed as uterine inertia. This abnormal adherence is due to cervical or corporal endometritis. It must not be confounded with abnormal resistance of the membranes, as the latter becomes a factor in delay of labor only after dilatation of the cervix has been accomplished. Löhlein advises the insertion of the finger into the cervix and detaching and rupturing the membranes, which cannot dilate the cervix and only protract the progress of labor.

Pernicious Anemia during Pregnancy.—Saniter, [7] at a recent meeting of the Berlin Gynecological Society, demonstrated a case of extreme anemia in a woman seven months pregnant. The patient stated that until two weeks before she was perfectly healthy and not anemic. The disease came suddenly with headache, dizziness, pallor, and prostration. The most pronounced symptoms are extreme pallor, rapid but regular pulse, anemic murmurs over the heart, and large veins. Hemoglobin reduced to about 30 per cent. The leucocytes are increased, the red blood corpuscles diminished to one-sixth. The red blood corpuscles are not altered in form, but the microscope shows the presence of a few megaloblasts with large nuclei. No swelling of spleen and lymphatic glands. Lungs and kidneys apparently normal. Area of heart dulness not increased. The prognosis in this type of cases is very bad. Graefe in 1880 collected 25 cases, all of which except one ended fatally. Saniter states that the interruption of pregnancy has been thought of. The case is under strict observation.

Vaginal Douches, Antepartum and Postpartum.—L. Napoleon Boston [8] believes that a profuse leucorrhea during the

latter months of pregnancy is no indication for vaginal douching. The chemical reaction of a discharge has but slight effect upon its antiseptic powers. The vaginal secretions of pregnant women rarely, if ever, contain pathogenic germs except gonococci. Vaginal douches favor the development of cervical gonorrhea and puerperal sepsis. The vaginal secretions may contain streptococci, staphylococci, diplococci, and bacilli, all of which may be non-pathogenic. A discharge from the cervix may show the presence of pathogenic bacteria after all other symptoms of sepsis have disappeared.

Chorea Gravidarum.—Backhaus[9] reports a case of chorea during pregnancy, from the Leipzig Maternity Hospital, which ended fatally, although pregnancy was interrupted. The patient was a woman, 21 years old, with a negative family history; never had rheumatism or heart disease. When admitted the patient was in the ninth month of gestation. When about six months pregnant she observed twitchings in the shoulders and arms, especially after exertion, which gradually increased in severity and finally assumed the character of typical chorea. The right side was more affected; speech indistinct; patient easily excited; area of heart dulness increased. The patient's bad general condition and inability to nourish indicated termination of pregnancy. Version and extraction of fetus. The patient continued restless after awakening from the ether. The choreic movements did not cease. Two days later she became comatose, and died with the symptoms of extreme exhaustion. Postmortem showed hyperemia of the pia mater, acute endocarditis, slight dilatation of the ventricles, bronchopneumonia especially marked in the lower lobes. The genital organs were normal.

Donat[9] also reports a case of chorea in a woman 25 years old, pregnant four months. Complains of progressive muscular twitchings. Until ten days before admittance the woman was in perfect health. Her previous pregnancies proceeded without abnormalities, except that three weeks after her confinement she had slight twitchings when nursing the child, which ceased after lactation was discontinued. Donat ordered absolute rest and administered bromide of potassium and Fowler's solution. The progress of the disease continued uninterrupted. Inability to nourish the woman produced symptoms of exhaustion. The patient was emaciated and subcutaneous hemorrhages covered the body. It was deemed advisable to interrupt pregnancy. The cervix was dilated, and with the advent of labor pains the convulsions ceased. The improvement after the expulsion of the fetus was marvellous, and, although slight twitchings continued for about six weeks, the general condition improved and the patient soon regained her former health.

Sänger,[9] in discussing Donat's case, states that he has observed 3 cases of chorea complicated by pregnancy. He says there is a marked difference between the benign form, corresponding to the simple chorea of childhood, and the malignant

variety, always complicated by diseases of the brain, heart, and kidneys. The former, probably due to reflex disturbances, improves after emptying the uterus, while the second variety is unaffected.

Rupture of the Uterus at Full Term.—Nathan Raw [10] reports a case of rupture of the uterus which occurred at full term and twelve hours after labor had commenced. The woman, who was treated by a midwife, was allowed to remain in this condition for three days, when she was brought to the hospital in a semi-conscious condition; her radial pulse was imperceptible and her skin cold and clammy. On examination a firm swelling was found in the posterior vaginal wall, the os uteri was high up, and the cord was pulseless. The cord was traced upward to the os. which was drawn up under the pubes and admitted the tips of two fingers. The os was rapidly di-lated, when the placenta was found attached in the lower seg-ment of the uterus, so that in addition there was placenta previa to deal with. The placenta was rapidly detached, when there was a severe hemorrhage, which was stopped by a hot intra-uterine douche. A leg of the fetus was grasped, then another, and the body brought down, when it became necessary to apply a forceps to deliver the head. The patient was trans-fused with saline fluid and her abdomen opened so that the uterus could be amputated and the ovarian cyst removed. The transfusion was tried again, but she slowly sank, and died in a few hours. She had a ruptured uterus—evidently caused by the mechanical obstruction to the passage by a large ova-rian cyst—placenta previa, prolapse of the cord, and a foot presentation.

Inversio Uteri complicating Placenta Previa.—R. W. Holmes [20] describes a case of placenta previa which occurred in a girl 19 years old. During the sixth month of her pregnancy she had a severe hemorrhage and Holmes advised performing a premature delivery. He applied a tampon, but the patient lost considerable blood past the tampon; he next inserted a Barnes bag, but this broke; then he tried manual dilatation for an hour and a half, when he got the cervix sufficiently dilated to attempt version. Version proved impossible on account of the tetanic condition of the uterus and the absence of liquor amnii. A Knox forceps was applied and the child delivered. After delivery it was found that the fundus was down in the vagina. The uterus was returned at once, only to follow the hand down immediately and to appear externally. Death took place soon after this occurred.

Three Cases of Conservative Cesarean Section.—Strauch [11] reports the following cases: *Case I.*—IIIpara, 26 years old. Uniform contracted rachitic pelvis. Conjugata diagonalis, 8.8 centimetres. First pregnancy, craniotomy. Sec-ond pregnancy, induction of premature labor. In this, the last pregnancy, Cesarean section was performed with good results for both mother and child. *Case II.*—VIpara, 33 years old. First labor difficult; high forceps; dead child. Second labor,

craniotomy. Third, fourth, and fifth pregnancies, induction of premature labor. Pelvic deformities were so extreme that difficult forceps and craniotomy were necessary to effect delivery. Sixth pregnancy successful. Cesarean section. *Case III.*— Primipara, 26 years old, with normal pelvis. About two years before being pregnant, vaginal fixation. Came under observation after being in labor twenty-one hours. In spite of severe pains, absolutely no dilatation. The cervix pointed backward. Os hardly within reach. There being danger from rupture of uterus, Cesarean section was performed. Upon opening the abdomen the whole anterior wall of the uterus and also the fundus were found to be firmly adherent to the vagina. Successful results for both mother and child.

Pelvic Hematocele.—Doléris' states that pelvic hematocele is not necessarily due to extrauterine pregnancy. He has observed a number of cases in virgins where pregnancy could positively be excluded.

Uterine Hemorrhage.—C. E. Purslow[12] has performed vaginal hysterectomy in two cases of intractable uterine hemorrhage. Neither of these cases yielded to the curette or showed any marked changes to the naked eye. Both cases made good recoveries. In both cases the menorrhagia commenced as a sequel to parturition or miscarriage.

GYNECOLOGY AND ABDOMINAL SURGERY.

The Uterine Lymphatics.—Peiser[19] has made a careful study of the anatomy of the pelvic lymphatics and found that two to four lymph ducts extend from the cervix along the lower border of the broad ligament to the hypogastric glands and from there to the glands surrounding the external iliac vein. Another set of lymph vessels ends in the sacro-uterine ligaments and sacral glands. It is a fact that in cancer of the cervix the pelvic lymphatics are already infected when the broad ligaments are apparently normal. Peiser writes that under such conditions vaginal hysterectomy can give no lasting cure, and, based upon his investigation, he advises in every case of *cancer of the cervix* laparatomy, removal of the uterus with its adnexa, extirpation of the pelvic glands and the adjacent connective tissue and fat and also of both broad and sacro-uterine ligaments.

Clinical Significance of Peptonuria in Pelvic Abscess.— W. F. Haehnlen[21] believes the presence of peptone in pelvic abscess to be significant of suppuration. When other known causes of peptonuria can be excluded, it certainly offers another diagnostic sign, at least, of a corroborative nature, to those with which we are already familiar, but which are so often absent in obscure cases. As leucocytosis is usually associated with sepsis, a blood examination should be made in connection with the test for peptone. He cites seven cases where there were suppurating masses in the pelvis. In all of these cases peptone was found in the urine, with the exception of one

case where there was a discrepancy in regard to peptone in the urinalyses.

Amputation of the Breast.—E. J. Senn [28] advises the anterior axillary incision, first, because it exposes a larger field for radical work ; secondly, because by making traction on the axillary flap it is easily freed from the subcutaneous tissues with a few strokes of the knife; thirdly, because injury to the vein is diminished; fourthly, because the axillary space is unfavorable to primary union; fifthly, because the incision is so situated that it does not impede free motion of the arm, and there is no subsequent cicatricial contraction as in an axillary scar; and, lastly, because the cicatrix is not dragged upon by motion of the arm, consequently the scar tissue is little exposed to trauma through mechanical stretching, thus diminishing the liability of a recurrence. The incision is made as follows: The breast is circumscribed by two curvilinear incisions which meet above at the border of the pectoralis major muscle. The incision is then continued slightly internal to the outer border of this muscle, in an upward direction, to a point about one inch above the apex of the axilla, where it takes an outward course in the deltoid region, forming a gradual curve, which terminates at the level of the apex of the axilla.

Cysts of the Breast.—W. T. Bull [29] states that in the last fourteen years he has noted thirty-nine cases of cystic tumor of the breast. The majority of these cysts were in married women who had had children (22 married, 17 unmarried), and in only 4 was there a history of mastitis or sore nipples. Trauma was noted in 6 cases as a possible cause. The ages were in 17 cases 40 to 50; 10 cases 30 to 40; 9 cases over 50; 3 under 30. The duration of the cysts varied from one week to ten years, but most were detected early, 17 being diagnosticated within three months from their appearance, 7 in from three months to one year, and 5 in from one to ten years. The size of the cyst has varied from that of a large bean to that of an egg, intermediate proportions being described as of the volume of an olive or chestnut. There was a single cyst in one breast in 26 instances, 2 or more cysts in 7, 1 in both breasts in 4, and 2 or more cysts in both breasts in 2 cases. An enlarged axillary gland has been seen in 2 cases, but it was not hard. About one-half of the patients discovered the tumors by accident; one-half had their attention attracted by painful sensations. The fluid contents have always been thin, turbid serum, gray or light brown in color. The microscopical examinations of this fluid and of the wall of the cyst have not been preserved. In many instances the following data will suffice for their recognition: They have a sharply rounded outline, with smooth surface and a feeling of elastic resistance on palpation between one finger and the wall of the chest, the patient being recumbent. The skin is never adherent nor wrinkled, though it may be tightly stretched over the cyst wall and the superficial veins enlarged. An enlarged but soft gland is occasionally felt in the axilla. The nipple is normal, and there is discharge from

it only very exceptionally. He has noted this feature in but one case (in two cases of cystic adenomata and in one of cystic carcinoma he has seen a bloody discharge). He believes the statement correct that bloody discharge indicates always papillary growths in the ducts and suggests malignancy, or at least such an approach to it as is found in the intracanalicular epithelioma. The history of slight twinges of pain with brief duration of the tumor suggests strongly the existence of a cyst, for small cancerous deposits are usually not painful. He thinks fully one-half of the cysts he has seen were associated with slight pain, and some, situated near the axilla, gave a history of pains radiating down the arm. The story that the tumor has disappeared and then reappeared makes the diagnosis probable. Puncture with needle and hypodermatic syringe is the final diagnostic test, and this should never be neglected. A good-sized stiff needle is desirable.

He states that his experience leads him now to make sure of his diagnosis by puncture and then to begin treatment in an average-sized cyst of one or both breasts with aspiration. He recommends excision only—(1) in case the cysts refill; (2) in case of unusually large single or multiple cysts; (3) in case the patient is of the exceptionally nervous type (cancerophobics). He discourages all injections into these cysts, and justifies external applications only as placebos. General cystic disease of the breast calls for excision of the breast, but the operation should be postponed until the cystic formation is pronounced and the volume of the breast increased. There is little evidence that this condition degenerates into cancer. One of his patients, a single woman of 40, had her cystic breast for thirteen years and in that time it only doubled its original size.

Mammary Cancer.—G. Ernest Herman [31] reports a case of recurrent mammary cancer which disappeared after treatment by oöphorectomy and thyroid extract. Four cases have now been published of cancer treated by oöphorectomy plus thyroid extract, and in three of them the cancer disappeared. The evidence at present goes to show that greater benefit results from the combination of oöphorectomy with thyroid extract than from either of them separately.

C. E. M. Kelly and W. D'Este Emery [32] report a case of colloid carcinoma of the breast. The tumor was removed, but recurrence and dissemination took place in three and a half years. The primary growth closely resembled a duct papilloma. Of the secondary growths those in the lung and sternum kept to the original type, while those on the liver and skull showed no trace of colloid degeneration.

Treatment of Chronic Endometritis.—E. E. Montgomery [30] states that the first consideration for treatment is to secure free drainage, and, second, to decrease congestion. Both these considerations are to some degree secured by placing and maintaining the uterus in its normal position, hence the value of tampons. Medicated with glycerin, they produce a free watery discharge which still further reduces the congestion. A narrow, tortuous canal should be curetted and dilated.

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Intrauterine irrigation with double-current tube is very efficacious. For this purpose hot water, plain or medicated, with bichloride $\frac{1}{3000}$, formalin $\frac{1}{1500}$, boracic acid $\frac{1}{100}$, or sodium bicarbonate $\frac{1}{50}$, may be employed. The efficacious astringents are zinc sulphate $\frac{1}{80}$ to $\frac{1}{20}$, zinc chloride $\frac{1}{100}$ to $\frac{1}{20}$, silver nitrate $\frac{1}{10}$ to $\frac{1}{5}$. The astringents in the stronger solutions are also caustic. Ichthyol in ointment with lanolin as a base is of value. It may be used in the strength of $\frac{1}{12}$ to $\frac{1}{4}$.

Treatment of the Attached Border in Simple Suture of the Intestines.—J. Ernest Frazer[32] puts forward a suggestion for treating the attached border of the gut in simple suture. It consists essentially in opposite rotation for a little distance, on the longitudinal axis, of each segment of the gut, one forward and the other backward, so that the plane of the mesentery of one segment lies a little behind that of the other; when the two segments are fixed in this position, the tissues in the triangular intervals are opposed to the opposite peritoneal coat, to which they can adhere quickly and firmly, and when this portion of the circumference is united the remainder, with the divided mesentery, can be sutured in the usual way. The theoretical advantage which lies in the principle suggested is in the fact that at every point in the sutured circumference there is peritoneum on one or both sides, thus allowing no more danger at the attached borders than at any other part of the divided edges.

Hysterectomy as a Conservative Operation—J. B. Sutton[33] states that a careful consideration of all the facts makes it clear that the uterus can only be considered as a receptacle or reservoir wherein oösperms may develop. It is secondary and certainly subservient to the ovaries. It is not a vital organ, and its removal entails two physiologic sequelæ in women during the sexual period of life—namely, amenorrhea and sterility.

It is necessary to discuss the uterus in this way because of the notion or superstition that there is something which distinguishes the uterus from other viscera, and that its removal is followed by mental aberration and other serious nervous disturbances. All this is now known to be mythical, but a careful consideration of the physiology of the ovary in the light of increased knowledge, mainly the outcome of surgical enterprise, leads us to a better appreciation of ovarian dominance and its tyrannical influence over the life and well-being of women.

Abdominal Section under Cocaine.—Hunter Robb[34] reports an abdominal section under cocaine anesthesia for retroverted adherent uterus in a case with marked cardiac symptoms and goitre. The adhesions were separated with but little apparent discomfort to the patient. It was noted that even slight traction on the ovaries produced considerable pain. The patient made an uninterrupted recovery.

Urethral Fistula.—A. J. Downes[21] reports a case of urethral fistula following curettement of a cancerous uterus. He opened

the abdomen and freed the ureter from adhesions as much as possible and straightened it. Three days after the operation all the urine passed by the bladder. He explains the cure by stating that the ureter was angulated between the uterus and bladder and had sloughed at the point of flexure, and emptied its urine from practically a circular rent into the remains of the uterine cavity. By straightening out the ureter this rent on its under or posterior surface was converted into a longitudinal slit, which rapidly healed. He also reports another case in which he performed primary and secondary celiotomy for angulation at the sigmoid flexure of the colon. The second operation was followed by fecal vomiting, but the patient recovered with the angulation cured.

Radiography with Reference to the Detection of Renal Calculi.—C. Mansell Moullin [23] states that calculi are very difficult to locate, owing to their very low absorptive index. As usually happens, the difficulty is always greatest in those cases in which the information is most needed—when, for instance, the calculus does not lie in the gall bladder but in the common or the hepatic duct, and when the patient is stout and middle-aged, with a large and firm abdomen which resists pressure. The best chance of success is to place the patient in the dorsal position, with the back well arched and the focus tube beneath. In this way the abdominal wall is made as thin and as tense as possible, the common bile duct is brought much closer to the surface of the body and to the plate than would be imagined by those who have not tried operating in this position, the liver is lifted up to some extent, and the densest tissues, the muscles of the back, are nearest to the light. The effect of this is to make the shadow which they cast more diffuse, so that it merely produces the effect of a darkened background upon which the shadows thrown are outlined.

Perineal Laceration.—Frank C. Hammond [21] states that among a few predisposing factors, besides a rigid, unyielding perineum, may be mentioned: (a) a very straight sacrum; (b) the direction of the vulvar opening; (c) diminution in the size of the vulva. The mechanism of labor is a causative factor: (a) in vertex presentations, rotation of the occiput into the hollow of the sacrum; (b) in face presentations, the largest diameter of the fetal head, the occipito-mental, must first pass through the outlet; (c) incomplete flexion. The physiological character of the labor is an important element: (a) a rapid labor; (b) tedious labor, the head remaining for some time at the lower strait. Anesthetic agents may be employed in: (a) rigidity of the perineum due to excessive irritability of the muscular fibres; (b) violent and rapid uterine contractions; (c) tedious labors. After the delivery of the placenta and the uterus is well contracted, a thorough examination should be made and a laceration, if present, should be repaired as soon as possible. At least twelve hours may elapse before a good union is obtained.

Closure of the Peritoneum after Laparatomy.—H.

O'Hara [12] advises the use of the following method for closing the peritoneum: Pass a continuous suture, either of silkworm gut or kangaroo tendon, around the cut surface, beginning at the centre of the incision. The needle is introduced about one-eighth of an inch from the cut edge, after the manner of a purse-string suture. Having surrounded the opening in this way, the ends are drawn tight and the opening is closed, the raw surface being puckered up externally.

Foreign Body in the Peritoneal Cavity.—Henry Briggs [12] cites the case of a woman who, while applying iodoform ointment by means of a crochet hook to an ulceration on her cervix, lost the instrument into her peritoneal cavity. The hook was directed backward against the sacrum. One week later the hook was removed through the posterior fornix. The recovery was uncomplicated.

Gonorrhea of the External Genitals in the Female.— A. B. Tucker [21] states that the glands in the connective tissue of the vestibule are the first to come in contact with the gonorrheal discharge from the male and are most frequently the first to be infected. The glands become distended; there is a discharge of pus, which the microscope will show to be filled with gonococci; sometimes the glands rupture and the surrounding tissues become infiltrated and have a boggy feel to the touch, while the discharge flows down across the vaginal mouth, carrying the infection to the internal genitals. The next point of special interest is the meatus of the urethra, with its two ducts of Skene; these ducts lie within the meatus, nearer the floor and on each side of the urethra; they are from three-eighths to three-quarters of an inch in length, dividing into numerous small cavities at their upper extremities. When infected, the tissues surrounding the mouths of these ducts become edematous and swollen, so much so that this condition is sometimes taken for a urethral caruncle, the swelling causing them to appear as one, the opening being hidden when this condition exists. The pus burrows up into the small cavities already spoken of, and there is more or less infiltration of the suburethral tissue. This may extend to the neck of the bladder. In the class of cases in which there are recurrent attacks, his experience has been that there is invariably a condition where the infection of the vestibule and Skene's glands has been overlooked, an almost similar condition existing as is found in latent gonorrhea of the male; in these cases the woman not only infects her partner in coitus, but she frequently reinfects herself in this way. The treatment of these cases is by local applications only. In his experience he has found these to be the most effectual. The method of application, when Skene's ducts are involved, is to take a filiform bougie of the smallest size, put just enough cotton to cover it, dip it in thiol, full strength, and pass it into the mouth of the duct. This is to be done every day until the discharge is almost entirely stopped, then every other day until no more pus can be squeezed out. In treating the other points mentioned, he satu-

rates a piece of absorbent cotton with the thiol and lays it over the whole vulva; over this he puts a dry piece of cotton to protect the clothing and tells the patient to wear a napkin over this.

Uterine Fibroma.—J. C. Rutherford[24] reports a case of retroversion of the uterus complicated with uterine fibroma. On this case he performed enucleation of the fibroma followed by ventral suspension. Six months after the operation the patient became pregnant; the pregnancy was normal and went on to term.

Fibroid in Uterus Unicornis.—Alban Doran[12] reports a case in which a fibroid tumor was removed from a uterus unicornis. The tumor was removed from a rudimentary second cornu connected by an impervious band with the well-developed side, which had twice borne a fetus.

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DISEASES OF CHILDREN.

Acute Gastro-enteritis of Nursing Infants.—A. Lesage[1] treats of the subject of the pathogenesis and etiology of digestive infections and intoxications. He divides the subject into two parts: first, the cases of acute gastro-enteritis due to some ordinary formation; and second, those due to the predominant action of special microbes. I. *Acute gastro-enteritis due to intestinal fermentation* (endogenous diarrheas of Escherich, Sevestre, and Thiercelin; dyspeptic diarrhea of Booker; pure cow's-milk dyspepsia of Marfan).—In these slight cases there is a process of putrefaction, which is indicated by the presence of indican in the urine and the bad odor of the stools. The causes of the temporary encumberment are: (a) Overloading with food. This is due to the general idea that all infants must receive a certain given amount of nourishment. All children cannot stand this treatment. Sometimes the cause is the imbibition of pure milk. The author holds with Budin that it is not necessary to dilute all milk taken by infants, but that under 4 months some infants require the dilution. It is his rule to give diluted milk to children in the first feedings;

and then after a few days to gradually diminish the amount of water, carefully watching the condition of the intestines meanwhile. (*b*) Defective feeding. Up to 6 months only milk can be digested. The giving of other food stuffs causes acute gastro-enteritis. (*c*) Special bacteriological conditions. Some infants, in whom even small doses of milk appear to produce fermentation, appear to possess a special bacteriological culture medium.

II. *Acute intestinal infections* (special acute gastro-enteritis of exogenous origin, Escherich).—The tendency is on the increase to attribute acute gastro-enteritis to the action of one or two varieties of microbes. As these microbes exist normally in the stools of nursing infants, we must bear in mind that in order to produce the disease they must exist in great abundance. For ten years the author has studied these cases in the hospitals of Paris, and has reached the conclusion that the association of microbes varies according to the year, the hospital, and even the wards of the same hospital. Associations also vary according to the country. Thus, in Germany acute gastro-enteritis with streptococci is more frequent than in France, where the pyogenous streptococcus is more apt to be found in slow and chronic forms of enteritis. Moreover, children who are admitted to a hospital with one form of bacteria may after a few days acquire others. The purer the culture the greater its powers for evil, according to Lesage; this is because the most active microbe predominates and chases out the others. The varieties of the disease studied by the author are: 1. *Acute gastro-enteritis with coliform microbes* (pure cultures).—These microbes exist alone. They are all decolorized by Gram's method. They vary greatly in form (cocco-bacillary, bacillary, strepto-bacillary may all be found in the same case). The author has endeavored to ascertain whether there is a special form of coliform bacillus, difficult of isolation and special to acute gastro-enteritis. So far his results have been negative. (*a*) *Secondary septicemia.* One hundred cases were examined, to see whether the microbes could pass into the blood, invade the organism, and cause septicemia. In 75 cases the blood remained sterile. In 25 cases the children, just before death, had coliform microbes in the blood. Thus secondary septicemia is *accessory, terminal,* and *inconstant;* it is occasionally observed at an earlier stage of the disease, shown by pulmonary and meningeal complications or enlargement of the spleen. The absence of coliform microbes in the blood appears to indicate that the affection is an intoxication. The toxin is found in the intestines, is absorbed, and produces the general symptoms in the same way as the choleraic toxin. (*b*) *Virulence of the coliform microbes in the intestines.* This is very unstable. (*c*) *Toxicity of the microbes.* A virulent microbe may be non-toxic, that is to say, it may not furnish poison in a given medium. A non-virulent microbe may, on the other hand, be toxic. (*d*) *Toxicity of the feces.* According to the author's experi-

ments, the contents of the intestines are not toxic. (e) *Agglutination*. In the acute stage of the disease, in a non-cachectic or non-athreptic child, the microbes may be agglutinated by the serum. But this property is inconstant, slight, and of short duration. There is no relation between the virulence of the microbes and the presence of agglutination.

2. *Acute gastro-enteritis with Escherich's streptococcus.*— An examination of the stools shows coliform microbes (stained red by the Weigert-Escherich method) and a great number of streptococci, stained violet. They are of all forms and occur throughout the whole intestinal tract. As to the lesions, they are characterized by the intense congestion of the intestines, with small hemorrhages. A muco-purulent secretion is produced. The closed follicles are often swollen and even ulcerated. 3. *Acute gastro-enteritis with coli-streptococci symbiosis*. The association of the two bacilli in a certain definite proportion is the cause of the trouble in some cases, according to Nobécourt. 4. *Acute gastro-enteritis with diplococci*. These are found in abundance in some cases. The author thinks them closely related to " intestinal grippe." 5. *Gastro-enteritis with micrococci*. These may be present in great abundance in blood, spleen, and kidneys, where they cause secondary septicemia. 6. *The proteus* has been observed in this disease in predominant numbers. 7. *The pyocyanic bacillus* has also been found. 8. *Yeast bacillus;* 9. *Bacillus lacticus;* 10. *The tyrothrix;* 11. *The mesentericus*, and 12. *The Klein bacillus,* have all been observed in cases of acute gastro-enteritis.

Contagion and Epidemics.—Epidemics of this affection are frequently noticed in any place where many children are gathered together, as in crèches. The author observed one such which was due to a green chromogenous coliform microbe present in the stools and in the milk taken by the children. One infected child entered the ward and this was enough to infect all the others.

Appearance of the disease in children subjected to the ordinary m ilk diet.—The microbes present in the air are less to be feared than those which come from the cow. A cow suffers from digestive troubles, especially when first turned out to grass, and its fecal discharges soil the udder, whence the infection of the milk. The virulence of the streptococcus in milk is very variable, sometimes *nil*. The same may be said for the coliform microbes. No soluble toxin is produced in the milk, in ordinary fermentation, nor in acid fermentation. Nor do the casein and the butter show any signs of toxin.

Acute gastro-enteritis in children fed with sterilized milk.—In the summer of 1898 the author studied 365 cases of this disease; 211 were fed with ordinary milk, 98 with sterilized milk (50 with milk at 100° C. [212° F.], 45 at 115° C. [238.8° F.]), 8 by breast milk, 48 by mixture of breast and sterilized milk. Every precaution was observed in the preparation and care of the milk and the bottles. It is evident that

an infant nourished by sterilized milk, or even breast-fed, may *during the heated term* be attacked by acute gastro-enteritis. The contagion cannot enter the milk from the surrounding atmosphere, and experimentation does not prove absolutely that there is a toxin in the sterilized milk, nor that under the influence of heat and storms there is any modification of the intestinal equilibrium, causing a change in the properties of the microbes, the acquisition of toxic powers, etc., nor that contagion is derived from the air; but further investigation may substantiate one or other of these theories.

Acute gastro-enteritis in breast-fed children.—The occurrence of the disease is rare under these circumstances, and when the affection is present it is light and easily cured. Its presence may be due to administration of cow's milk in addition to that of the mother or wet-nurse. Sometimes there seem to be individual peculiarities in the composition of the milk which account for the trouble, such as an excess of casein and butter, salts, or lactose. Some infants may during the whole of lactation pass green, acid stools while constantly increasing in weight; this is apt to occur when the wet-nurses are arthritic, gouty, obese, and overfed. The diarrhea often occurs during the nurse's menstrual period or at the time when the period would occur if present.

Bacteriological examination is essential to an exact diagnosis of the forms of diarrhea. Clinically, certain symptoms point to the *probability* of the presence of certain bacteria. Thus, *small hemorrhages* point to the streptococcus, *glairy secretions* to the enterococcus of Thiercelin, a *fetid odor* to a mixed infection. Long duration and a chronic condition indicate a complexity of bacteria.

Septicemia and diarrhea may coexist, and it may be difficult to decide which of the two is secondary. The author thinks that many cases of septicemia may be traced to the intestines. Intestinal grippe has been observed within the past year. The child has coryza, anorexia, some bronchial râles, fever, and diarrhea. Great numbers of enterococci are present.

A differential diagnosis from typhoid is not possible.

Diphtheria.—J. Richardson Armstrong,[2] in writing of the use of antitoxin in general practice, states that up to June, 1897, he had no opportunity personally of judging of the value of antitoxin in the treatment of diphtheria, but during that month and the following months of 1897 an epidemic of the disease occurred in his practice and he was able to form his own opinion of the value of the remedy and to watch cases going on side by side, the severe cases being invariably injected and the mild cases being treated by the internal administration of perchloride of iron combined with acetate of ammonia (ten minims of the solution of the perchloride of iron and one drachm of the solution of acetate of ammonia to half an ounce of water, to be taken every four hours, for a boy of 16 years, dose in proportion to age). From June 27 to December 17, 1897, he treated 42 cases of diphtheria. There was a mortality

of 14¾ per cent, with a 9 per cent mortality for the more severe and injected cases, and a mortality of 20 per cent for the more mild and non-injected cases. The subjoined table shows at a glance the value of antitoxin:

	Severe cases injected.	Mild cases non-injected.
Disappearance of membrane averaged	Two and three-quarter days.	Five and two-third days.
Recovery..............	One to two weeks	Two to four weeks.
General condition during attack.	Good after the first day or two.	Unsatisfactory for a day or two.
Condition of the heart..	Regular and satisfactory after the first few days.	Shaky and weak for over a week, and unsatisfactory for a week or more longer.
How long confined to bed.	One week or so.........	Two weeks or more.
Mortality.......... ...	9 per cent.............	20 per cent.

During 1898, from January 1 to December 31, he treated 80 cases of diphtheria, many of them of a very severe type and primarily laryngeal, and the very worst forms of the disease, and he had only three deaths during that period, or a mortality of 3¾ per cent. Of these 80 cases he injected 55 and treated the other 25 with the solution of perchloride of iron and the solution of acetate of ammonia and brandy internally, and did not inject antitoxin—*i.e.*, he injected 68¾ per cent of the cases. In two of the fatal cases the parents refused to have the antitoxin injected, in spite of warnings. In the third fatal case one injection was allowed and a second one refused. Hence but for the ignorance and prejudice of these parents the author believes that the mortality would have been *nil.* In 1897 he injected 52 per cent of all his cases, while in 1898 he injected 68¾ per cent, hence the mortality of 3¾ per cent as compared with 14½ per cent. Taking the whole of the cases treated with and without antitoxin, there were 122 cases, with 9 deaths, or a mortality of 7½ per cent.

The annual report of the medical officer of health for the Rhoudda valley for 1897 says that there were reported in that district 247 cases of diphtheria, with 78 deaths, or a mortality of over 30 per cent. The deaths in London from diphtheria in 1897 are given as 2,328 out of a total of 13,192 cases reported, or a mortality of over 17½ per cent. A glance at these mortalities seems to give but one explanation, that the general practitioners of the day do not employ antitoxin as often as they ought to do in the treatment of diphtheria. In his cases Dr. Armstrong injected 1,500 units of antitoxic serum under the skin of the abdomen, using always the liquid, not the dried serum. This he usually found enough to cure the patient, and in only 5 cases out of the 77 injected was a second injection called for after an interval of from two to three days. If the

patient does not show a marked tendency toward improvement within twenty-four hours of the first injection, or if the membrane does not clear up by the third or fourth day, a second injection is indicated. The author has seen no bad effects follow the use of antitoxin. He does not go so far as to say that it is absolutely essential to inject in every case, although he considers it excellent practice to do so and that the patients would make much more rapid recoveries. He thinks that in every case, however mild, the patient should have the option of an injection, and that injection ought to be insisted upon as early as possible in every case that is at all severe or likely to prove so. The earlier the patient is injected the greater is the chance of recovery. The author invariably keeps his patients on perchloride of iron and acetate of ammonia and brandy, administered internally, in addition to injecting them.

Heart Disease in Children.—An editorial[3] says that the clinical history of heart disease in children may be divided into three periods—acute inflammation (endocarditis), compensation (hypertrophy), heart failure (dilatation). These periods are not always clearly defined, nor do they always follow in the same order. All that treatment can effect is to establish and maintain compensation. If this be perfect already, as it often is in children, there will be no symptoms of heart disease and nothing to treat. It is improper to treat a child for *heart disease* simply because a murmur has been heard in examining the chest, but the parents should be informed of the condition present and told to seek the physician's advice at the first sign of anemia or impaired nutrition. Heart failure may take the place of compensation with surprising rapidity. Nutrition should be maintained at the highest possible point, exercises and games should be regulated, and intercurrent attacks of illness should receive especial attention. The child must be guarded from every condition that would tend to precipitate an attack of rheumatism. The interval from the thirteenth to the fifteenth year is a period of especial danger in cases of heart disease, for the heart grows then with rapidity. The prognosis of cardiac disease is, on the whole, better in the child than in the adult, but this is largely modified by the surroundings and social condition of the patient.

Another editorial says that diseases of the heart present many peculiarities during early life. They develop between the fifth and twelfth years more frequently than at any other time, and occasionally follow measles, diphtheria, and scarlet fever, especially when renal symptoms are present. In the great majority of cases, however, the exciting cause is rheumatism. A cardiac murmur is frequently heard during the course of chorea. This sometimes, but rarely, disappears, and is, as a rule, organic. There is strong ground for the belief that chorea complicated by endocarditis is always rheumatic chorea, and that the endocarditis is in fact an expression of rheumatism rather than of chorea.

A third editorial states that although the valvular murmurs

accompanying cardiac disease are not to be taken as the only guide as to the severity of the condition present, they are very important, and their character should be determined in every case. The mitral regurgitant is the most frequent, according to some observers, being present in 90 per cent of all cases. Mitral stenosis occurs with comparative frequency. Pain is more common with it than with any other murmur, while bronchitis and coughs are frequent and very rebellious to treatment. This murmur does not occur under the age of 5 years. It is more commonly overlooked than any other murmur. It is harsh, rattling, and blubbering, and differs from other murmurs in that, instead of rising to a maximum and then gradually shading off into silence, it rises rapidly to a maximum and suddenly ceases as the apex strikes the chest wall. When the regurgitant murmur is present, as is usually the case, the two sounds run so closely together as to be distinguished with great difficulty. The regurgitant murmur is transmitted to the left, while the area of transmission of the obstructive murmur is circumscribed. Aortic obstruction ranks next in frequency to mitral regurgitation. Aortic regurgitation is the least frequent left-side valvular lesion, and rarely, if ever, occurs alone in early childhood. Aortic murmurs are more definitely associated with a rheumatic history than are the mitral and indicate a more extensive endocarditis. The symptoms of heart disease are more extensive, dyspnea and palpitation upon exertion are almost constant, and persistent anemia is also common.

A fourth editorial speaks of pericarditis as a factor in the heart disease of early life. It is the most striking postmortem phenomenon in fatal cases. The conclusions to be drawn from analyses made by Dr. Lees and Dr. Poyntar seem to be that endocarditis and pericardial effusion have very little share in the production of the fatal result in the rheumatic heart disease of early life, and that the main factors responsible for the mortality and for a large part of the cardiac crippling in those who survive are pericarditis of plastic type and dilatation of the heart. In examining clinically the heart of a child suffering from rheumatism, it should be borne in mind that murmurs are of comparatively little importance in the immediate prognosis, but that the points which it is essential to determine are evidence of pericardial friction and of cardiac dilatation. The editor agrees with Dr. Lees that the prognosis of rheumatic heart disease in children must be founded mainly on three facts—the amount of cardiac dilatation, the presence or absence of pericarditis, and the evidence of fresh rheumatic toxemia as shown by attacks of sore throat, erythema, rheumatic nodules, arthritis, and chorea.

Infections of New-born Infants in the Incubator.—Georges Bertin ' quotes from Lorain the saying that "the child comes into the world provided with apparatuses which do not function and with others that have not yet performed functions." While he is getting rid of the first, which up to that time have been

the source of his existence and are now useless, and trying to become accustomed to the others which are often imperfect as yet, he is in a transitional physiologic condition, with an imperfect vital equilibrium which renders him more vulnerable to physical and chemical agents, and more accessible to the various infections. These conditions are of course at their worst in debilitated new-born infants, in whom all the apparatuses are really insufficient, either because they are incompletely developed or because they have undergone alterations *in utero*. The debilitated new-born infant is usually the one born at the sixth, seventh, or eighth month. The most injurious agent is cold, which produces in them sclerema. New-born infants suffering from congenital debility have hypothermia, their rectal temperature being only 36° (96.8° F.), 35° (95° F.), or even 30° (86° F.). After the initial fall, which is very marked, the temperature does not rise as it does under normal conditions. This hypothermia is due to several causes. 1. The greater loss of caloric by radiation owing to the absence of adipose tissue and to the relatively greater extent of the cutaneous surface. 2. To the diminished production of heat because of the insufficient organic combustion caused by the weakness in the respiratory and circulatory functions. 3. To the imperfect development of the nerve centres. In a normal state the losses of heat of the organism are compensated for by the acquisition of heat ; according to Richet, this is regulated by a bulbar thermic centre which receives reflex stimulation from the periphery. In the prematurely born infant this centre works imperfectly and the loss and the acquisition of heat are not in proper proportion. To combat this hypothermia various methods have been resorted to for the purpose of putting the child in a condition of heat as nearly as possible the same as that of the uterus—such as wrapping the body, limbs, and back of the head in wadding, placing hot-water bags around it, keeping the room at a temperature of 19° to 20°, etc. When the child's temperature is below 36° (96.8° F.), these measures do not suffice—as Guéniot said, the child must be *incubated, penetrated by heat*. Only by this means can the circulation, respiration, and other major functions of the body work properly. Hence the incubator. In 1887 Berthod compared the mortality among the infants born in the Maternity Hospital in Paris between the years 1876 to 1881 and 1881 to 1886. In the former period Tarnier's incubator was not yet in use, but was used in the latter period. Before its introduction infants weighing less than 2,000 grammes, brought up in the ordinary air, died at the rate of 66 per cent, while after the introduction of the incubator the proportion was only 36 6 per cent. These figures prove the great utility of the device. There is, unfortunately, a reverse side to the medal. Marfan was the first to call attention to the fact that " the apparatus requires incessant watching in order to prevent lowering or raising of the temperature, and that it is extremely difficult to keep it aseptic; it is also a source of infection through the ventilation—when the air is

filtered through cotton, it is difficult to secure enough of it to insure respiration; when not filtered, the dust of the atmosphere is gathered in and surrounds the child. This is doubtless the origin of the broncho - pneumonia which so frequently attacks the prematurely-born."

The author's observations prove that the incubator may transmit infections, gastro-intestinal, cutaneous, or pulmonary. Broncho-pneumonia usually develops without fever, and is shown only by a little dyspnea, cyanosis, and progressively lessened weight—systematic and careful auscultation may possibly reveal a few fine râles in the chest. At the autopsy we find single or multiple hemorrhagic foci, disseminated or confluent, superficial or deep, mingled with nodules of broncho-pneumonia. Under the microscope we see by the side of the lesions of broncho-pneumonia true pulmonary infarcts, a result of the congestion of the organ. These broncho-pneumonias are due to infection of the respiratory passages by the streptococcus, the staphylococcus, the bacillus coli, and the pneumococcus. The septic germs originate: 1. In the skin and mucous cavities of the child. 2. Externally, from the air and dust accumulated in the incubator, from the hands of the attendants, and from the food.

An incubator should be thoroughly disinfected and placed in pure air, in a not overcrowded or overfurnished room. The atmosphere of the incubator should be moist, well ventilated, and of a constant temperature. Whenever the child is taken out to be fed, all causes of chilling or of infection should be strictly avoided. Under these conditions an incubator may safely be used for prematurely-born infants whose weight is less than 2,000 grammes ($4\frac{1}{2}$ pounds), whose temperature is less than 36°, and in newly-born infants suffering from sclerema. It should be avoided in the case of infected children. The child should be removed as soon as its general condition, its weight and temperature permit. In hospitals an incubation room may often be preferable to incubators. Asepsis of the skin and antiseptic dressing of the cord and of slight wounds will prevent infections of cutaneous origin, while intestinal infections may be averted by suitable alimentation.

Intubation in Post-rubeolar Laryngitis.—A. Filè-Bonazzola and Urbano Melzi,[1] in the course of an article upon laryngitis, report two cases of the affection following measles, in which intubation was performed with the happiest results. They are decidedly in favor of the procedure, for which they plead with eloquence, summing up its many advantages as compared with tracheotomy. They quote Landouzy in reference to the latter operation, who writes thus: "Let us follow out the course of some patients who have undergone tracheotomy and we shall be struck by the air of weakness which they all possess; they appear to have lost their vigor, and not only do they not become strong men with large chests and strong muscles, but they scarcely ever live to be 20 years old; candidates for tuberculosis from the date of the operation,

they sooner or later become affected by pulmonary tuberculosis. Long before you young doctors have become gray you will no longer be able to find any of the patients upon whom you have operated, and if you do chance to see any in the hospitals it will be because they have come there to be treated for tuberculosis." Jules Simon, who has spent his life in children's hospitals, has never known a case of tracheotomy to reach adult life. Having adduced all possible reasons to prove the superiority of intubation over tracheotomy in general, the authors speak of its value in cases of post-rubeolar laryngitis. Some writers have opposed its use under these circumstances, holding that the disease has a special tendency toward the formation of ulcers. The authors hold that this is only an occasional occurrence, while there are many cases in which, without the presence of any such lesions, there is marked dyspnea. Blankaert, indeed, has never found either ulcerations or erosions in these cases, but at the autopsy of all the children who had severe laryngeal symptoms has found injection and swelling of the mucous membrane, and in two cases small, soft, and thin membranes, easily removable in shreds; and Evrard has never seen anything else than fibrinous exudations covering the organs. The authors are inclined to believe that the ulcers are formed by defective technique in handling the tubes. In the invasion period of measles the inflammation of the mucous membrane may be sufficiently marked to cause laryngismus stridulus; the lesions of the larynx are at this time never severe enough to prevent the introduction of the tube. As to the post-rubeolar laryngitis, there are three forms, dependent upon the condition of the mucous membrane. In the first it is red, more or less inspissated and covered with mucus ; in the second there are ulcers, and in the third there is a membrane. Martin has collected statistics of 29 cases of pseudo-membranous croup which were non-diphtheritic and consecutive to measles. In the first and third varieties there is surely no reason why intubation should not be performed. In the third the same arguments apply as in the case of diphtheritic croup, in which, as we know, such brilliant results have been obtained by Bokay, Waxham, Lovett, Ganghoffner, O'Dwyer, and Sevestre. Bokay cured 12 out of 13 children suffering from grave croup by intubation. In Chicago, Waxham, out of 421 cases of intubation for croup, had 146 cures, or 34.6 per cent. Lovett, in Boston, had 20.4 per cent of cures, while tracheotomy gave only 5, 6, and 7 per cent. Ganghoffner, in Prague, had 8 per cent of cures with tracheotomy and 20 per cent with intubation. O'Dwyer, out of 300 cases of intubation, had 30 per cent of cures, Dillon Brown 32 per cent in 57.3 cases, and Sevestre had only 8 deaths in 64 cases. These statistics the authors consider to be the best possible argument in favor of intubation in croup. In post-rubeolar laryngitis the only form which contraindicates the procedure is the ulcerative. In all other cases intubation should be resorted to preferably and promptly as soon as respiration be-

comes at all impeded. Only in case the tube is rejected once or twice should we resort to tracheotomy.

Sarcoma.—Frederick A. Packard [10] reports a case of multiple sarcomata in a child $3\frac{1}{2}$ years old. He was brought to the Children's Hospital in Philadelphia for some trouble with his hip. A tumor mass was found in the left thigh, and there was complete absence of joint trouble. Later tumors developed in the left scapula and at the right angle of the jaw, and gradually increased in size while the child lost flesh. For diagnostic purposes portions of tumors were removed, and were found to be typical round-celled, alveolar sarcomata. An examination of the blood showed red cells, 2,840,000; white cells, 11,000; hemoglobin, 31 per cent; poikilocytosis was marked; many macrocytes and nucleated red cells. A differential count of the leucocytes gave: polymorphonuclears, 51 per cent; small lymphocytes, 29.5 per cent; mononuclears, 9 per cent; transitionals, 4 per cent; eosinophiles, 6.5 per cent. There were also a few myelocytes. Treatment by the toxins of streptococcus erysipelatosus and bacillus prodigiosus was planned, but not carried out because the child was removed from the hospital and not seen again. The case is one of many which suggest the possibly close connection between sarcoma, Hodgkin's disease, and leukemia.

REFERENCES.

[1] Clinical Monographs, No. 17. Masson & Co. [2] Lancet, Mar. 4. [3] Arch. of Ped., Apr. [4] Rev. prat d'Obst. et de Ped., Apr. [5] Annals of Gyn. and Ped , Mar. [6] Ped., Apr. 1. [7] Boll. della Poliambulanza de Milano, Mar. [8] Rev. mens. des Mal. de l'Enf , June. [9] Arch. de Méd. des Enf., June [10] Ped., Mar. [11] La Tuberculose infantile, June 15.

ITEM.

The American Association of Obstetricians and Gynecologists will hold its twelfth annual meeting in the assembly room of the Denison House, Indianapolis, Ind., Tuesday, Wednesday, and Thursday, September 19, 20, and 21, 1899. Executive session with closed doors on Tuesday, September 19, at 9:30 A.M., for the election of new Fellows. The open session for the reading of papers will begin at 10 o'clock. Recess for luncheon at 1 o'clock P.M.; afternoon session at 3 o'clock; recess at 5:30 o'clock; evening session at 7:30 o'clock. The morning session will begin Wednesday at 10 o'clock for the reading of scientific papers; recess at 1 o'clock; afternoon session at 3 o'clock; adjournment at 6 o'clock; at 6:30 P.M. executive session for the election of officers and for other business. The morning session, Thursday, 9:30 o'clock to 1 o'clock P.M.; afternoon session at 3 o'clock, and at 5 o'clock the closing ceremonies. At 7:30 o'clock P.M., Wednesday, immediately after the executive session, the annual dinner will be served at the Denison House.

PAPERS PROMISED.

1. The President's Address—Edward J. Ill, Newark. 2. Three Rare Cases of Kidney Cyst—J. F. Baldwin, Columbus. 3. Postpartum Repair of Lacerations of the Cervix Uteri—Clinton Cushing, Washington. 4. The Gonorrheal Puerperium—Charles G. Cumston, Boston. 5. Paper by Rufus B. Hall, Cincinnati. 6. Injury to Ureter in Abdominal Section—L. H. Dunning, Indianapolis. 7. Paper by J. B. Murphy, Chicago. 8. Coccygeal Dermoid Fistulæ—Robert T. Morris, New York. 9. Paper by X. O. Werder, Pittsburg. 10. Paper by Walter A. Jayne, Colorado. 11. Paper by C. C. Frederick, Buffalo. 12. Paper by Walter B. Dorsett, St. Louis. 13. Paper by J. Henry Carstens, Detroit. 14. Choice of Method for Total Hysterectomy and Some Points of Technique—B. Sherwood-Dunn, Boston. 15. Present Position of Gall-stone Surgery, with Report of Cases—William Wotkyns Seymour, Troy. 16. Paper by John B. Deaver, Philadelphia. 17. What Shall we Do with the Post-operative Hemorrhage of Celiotomy?—D. Tod Gilliam, Columbus. 18. Paper by M. Rosenwasser, Cleveland. 19. Choice of Operative Method from a Mortality Point of View—Joseph Price, Philadelphia. 20. Shall we Operate during the Viability of the Fetus when At or Near Term?—L. H. Dunning, Indianapolis. 21. The Deleterious Influence of Tea and Coffee in a Certain Class of Gynecological Cases—Walter B. Chase, Brooklyn. 22. One Form of Ovarian Disease Not Generally Recognized—W. H. Humiston, Cleveland. 23. Personal Experience with Uterine Fibroids—Henry D. Ingraham, Buffalo. 24. Midsummer Operations—Joseph Price, Philadelphia. 25. Observations respecting the Symptoms and Treatment of the Menopause—Augustus P. Clarke, Cambridge. 26. Paper by Charles Stover, Amsterdam. 27. A Simple, Effective, and Esthetic Operation for Shortening the Round Ligaments—H. W. Longyear, Detroit. 28. Some Observations, chiefly Clinical, upon the Temperature after Intraperitoneal Operations—L. S. McMurtry, Louisville. 29. Rupture of the Puerperal Uterus, with Cases—James F. W. Ross, Toronto.

The permanent programme will be classified and issued August 25, after which date no further titles can be added. One of the sessions, or as much thereof as may be necessary, will be devoted to the presentation of pathologic specimens and their histories, with discussion pertaining to the same. It is especially requested that photographs of these specimens be *filed with the histories*, from which engravings will be made for the Transactions. The medical profession of Indianapolis will tender a reception to the Association on Tuesday evening at 9 o'clock, which Fellows and guests are expected to attend. All members of the medical profession are cordially invited to attend the scientific sessions.

EDWARD J. ILL, *President.*
WILLIAM WARREN POTTER, *Secretary.*

ORIGINAL COMMUNICATIONS.

THE VALUE OF ANTISTREPTOCOCCIC SERUM IN THE TREATMENT OF PUERPERAL INFECTION.

(REPORT OF THE COMMITTEE OF THE AMERICAN GYNECOLOGICAL SOCIETY, MAY, 1898.)

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Washington, D. C.

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Boston.

I.

Your Committee have to report that during the past year they have considered the question of the efficacy of antistreptococcic serum in the treatment of those forms of puerperal fever due to streptococcus infection. They regret, however, that the experimental work which they have begun upon the subject is not yet concluded, and that they are, therefore, compelled to base their present report upon a careful study of the literature upon the subject, and their personal experience in the treatment of streptococcic puerperal infection, reserving for a later report the results of their experimental work.

Note.—Owing to lack of space, all temperature charts have been omitted. They may be found in the Transactions of the American Gynecological Society for 1899.—Editor.

In the present report, your Committee will give in the first place a brief review of the history of antistreptococcic serum, and will then consider the results obtained by the various observers who have used it in the treatment of puerperal infection. We shall then consider the experimental work which has been done upon the subject and its bearing upon the results obtained at the bedside. And, after having reviewed the literature upon the subject, we shall consider the personal experience of members of your Committee in the treatment of streptococcus infection during the puerperium; and, finally, we shall combine the results of our own work with our literary studies, and attempt, if possible, to deduce therefrom certain conclusions for our guidance in the treatment of such cases in the future.

Although many investigators had previously studied the question of immunity, and attempted to cure streptococcic infection by the use of serums, the history of antistreptococcic serum practically began on February 23, 1895. For, on that date, Marmorek presented a communication to the Société de Biologie of Paris, in which he stated that he had been able so to increase the virulence of streptococci that they would always produce death in rabbits, and that he was at that time engaged in the preparation of an efficient antistreptococcic serum.

He showed that streptococci ordinarily lose their original virulence with great rapidity in ordinary bouillon cultures, but that they would retain it when cultivated in a mixture of two parts of bouillon and one of human blood serum; and stated that by the use of this culture medium, in connection with the usual methods of increasing the virulence of streptococci, by passing them repeatedly through the bodies of animals, he had been able to raise their virulence to such an extent that the one hundred billionth part of a cubic centimetre of a bouillon and blood serum culture would kill a rabbit within twenty-four hours.

When experimenting with such infinitesimal doses of this very virulent organism, he found that only one rabbit out of four died, but that they all died when the one hundred millionth of a cubic centimetre was administered; and he attributed this apparent contradiction to the fact that in the first-mentioned dose he had reached the physical limit of dilution. So that in all probability many doses were so dilute as not to contain a single streptococcus. But death was certain when a single one of the very virulent streptococci was present.

At the same meeting, Charrin and Roger announced that they had succeeded in producing an efficient antistreptococcic serum by injecting into mules large quantities of sterilized cultures of streptococci; and stated that on February 6 they had

successfully treated a case of puerperal fever with it, and in a footnote mentioned that they had obtained very good results from its use in another case.

A few weeks later, Marmorek presented a second communication upon the subject, in which he stated that he used his serum in 46 cases of erysipelas with most beneficial results.

In the July number of the *Annales de l'Institut Pasteur* for 1895, he published a long article in which he gave a detailed account of the methods which he employed in preparing his serum, and reported the results which he had obtained by its use in the treatment of 413 cases of erysipelas in Chantemesse's clinic, in which the mortality was only 3.4 per cent.

He also stated that he had treated 16 cases of puerperal fever by the same method. In all of these cases, he examined the uterine discharges bacteriologically and refrained from local treatment while using the serum. In 7 cases he had to deal with a pure streptococcic infection, and all of them recovered. In 3 other cases the streptococcus was combined with the colon bacillus, and all of them died. In 5 other cases the staphylococcus was associated with the streptococcus, and of these 2 died. While in the last case, in which the infectious agent was the colon bacillus, the serum appeared to have no effect.

From his experience in 16 cases, he concluded that his serum was a most efficacious means of treatment in cases of pure streptococcus puerperal infection, but that it was useless if other organisms were combined with it ; as in such cases the serum could only neutralize the effects of the streptococcus, but could not be expected to have any effect upon the organisms associated with it.

He therefore concluded that the first essential in the treatment of puerperal infection was the bacteriological examination of the uterine secretions, as one could only expect the serum to be beneficial in the cases which were positively due to the streptococcus; and that successful results could only be anticipated when the use of the serum was begun at a sufficiently early period, it being understood that all local treatment, such as douches and curettage, should be abandoned during its employment.

Marmorek's article excited the greatest possible interest, and the hope was universally expressed that subsequent experience would demonstrate the correctness of his claims. In a short time many observers made use of the serum in the treatment of puerperal infection, not to mention its use in various other forms of streptococcic infection, such as erysipelas, scarlet fever, angina, etc.

In April, 1896, Charpentier was able to report to the Obstet-

rical Society of France 40 cases of puerperal infection, not including Marmorek's 16 cases, in which antistreptococcic serum had been employed by the following observers: Roger and Charrin, Gaulard, Merigot de Treigny, Ribemont-Dessaignes, Martellière and Charpentier, Maygrier, Bar, Porak, Budin. and Vinay. Of the 40 cases, only 24 recovered. Five of the fatal cases were of no value in considering the effects of the serum, as they were moribund when first seen, thus leaving 35 available cases with 12 deaths, a mortality of 35.29 per cent. Not all of these cases were examined bacteriologically, and, on analyzing those which were, he found that streptococci were demonstrated in pure culture in 16 cases, of which 7 died; while in 8 other cases the streptococcus was associated with either the staphylococcus or colon, or both, of which 4 died; thus making a total mortality of 11 out of 24 cases, or nearly 48 per cent.

After such a showing, Charpentier was naturally not very enthusiastic, especially as Gaulard believed that the use of the serum had hastened the death of one of his patients, and as the experience of the other observers had shown that its use was not unattended by danger; for several of them had observed local abscesses and an increase in the amount of albumin in the urine after its use, not to speak of a very troublesome erythema in some cases. Charpentier, therefore, concluded that the results following its employment were not as brilliant as he had been led to expect, and, while it might be used in appropriate cases, he believed that Marmorek's advice to discard all local treatment during its employment could not be conscientiously followed.

In the discussion which followed this paper, most of the speakers indorsed Charpentier's conclusions, and Budin went so far as to state that he considered the serum absolutely useless. At the same meeting, Charpentier's statements were abundantly confirmed by Bar and Tissier, who three months later published in *L'Obstétrique* a long article upon the subject, in which they stated that the results obtained by its use were far from satisfactory.

The unfavorable opinion elicited in this discussion did not, however, prevent large numbers of observers from continuing the use of the serum, especially in France and Great Britain, while it was comparatively little used in this country and hardly at all in Germany.

Its very limited use in Germany was probably due to the influence of Petruschky, who stated, as the result of his experi-

ments in the Hygienic Institute of Berlin, that Marmorek's serum, as well as one prepared in Lyons, was absolutely inefficient, and that their use upon human beings could not be recommended.   Similar views were also expressed by Lubarsch.

Indeed, the only German who has reported the use of antistreptococcic serum in any number of cases is Savor, who employed it in 15 cases of puerperal infection which occurred in Chrobak's clinic in Vienna, with 1 death.   In spite of these apparently favorable results, however, he concluded that it had very little influence upon the course of the infection, but at the same time stated that he had observed no ill effects from its use and would continue to experiment with it in appropriate cases.

We have collected from the literature, as far as possible, all cases of puerperal infection in which antistreptococcic serum has been used up to the first of April, 1899, and we find that it has been used in France by twenty-seven observers in 214 cases, in Germany by one observer in 15 cases, and in Great Britain and this country by many observers in 123 cases, making a total of 352 cases treated up to the present time.

TABLE OF CASES TREATED WITH ANTISTREPTOCOCCIC SERUM.

Cases in which a Bacteriological Diagnosis is made.

CONTINENTAL.

Observer.	No. of cases.	Cures.	Deaths.	Observer.	No. of cases.	Cures.	Deaths.
Ausset and Rouze.....	1	1	0	Laruelle	1	1	0
Bar and Tissier........	13	5	8	Marmorek	15	10	5
Pudin	4	2	2	Martellière and Charpentier	1	1	0
Bué	1	1	0				
Butin	2	2	0	Paté (Bar)	8	4	4
Dubrisay.............	1	1	0	Queirel	1	1	0
Durante and Siron....	1	1	0	Savor..	15	14	1
Flandrin	1	1	0	Wallich	2	0	2
Gaulard	1	0	1	Weinstein	1	0	1
Laran (Ribemont-Dessaignes).............	1	1	0				

ENGLISH AND AMERICAN.

Observer.	No. of cases.	Cures.	Deaths.	Observer.	No. of cases.	Cures.	Deaths.
Brack	1	1	0	Norris......	1	1	0
Dobbin.	1	1	0	Paddock	1	1	0
Douglas	1	0	1	Raw	3	1	2
Edmunds.............	1	1	0	Raw	1	1	0
Fry	3	1	2	Reddy	1	1	0
Groth	1	1	0	Saunders.	4	3	1
Hastings	1	1	0	Sharp......	1	1	0
Haultain	2	1	1	Shaw	1	1	0
Lockhart	1	1	0	Shoemaker	1	0	1
Marx	1	0	1	Steele	2	2	0
Mumford	1	1	0	Williams. J. D........	1	1	0

Total, 101 cases, 33 deaths, a mortality of 32.69 per cent.

Cases in which a Bacteriological Diagnosis was not made.

CONTINENTAL.

Observer.	No. of Cases	Cures	Deaths.	Observer.	No. of Cases.	Cures.	Deaths.
Bar and Tissier........	2	0	2	Ledrain	1	1	0
Berthod..............	1	1	0	Lop	2	2	0
Charrin and Roger....	2	2	0	Maygrier.............	2	0	2
Gaulard	1	1	0	Merigot de Treigny....	1	1	0
Jacquart	1	1	0	Porak	3	2	1
Josuè and Hermany ..	1	1	0	Queirel	14	12	2
Laran (Ribemont-Des-				Wallich	102	99	3
saignes)	23	18	5	Vinay	3	2	1

AMERICAN AND ENGLISH.

Andrew	1	1	0	Lockhart.............	1	0	1
Adam	1	1	0	Mapleton.............	1	1	0
Baldy.	1	0	1	McKerron............	3	2	1
Campbell	1	1	0	McNalty	1	1	0
Campbell	1	1	0	Montgomery........ .	3	3	0
Clark	1	1	0	Montgomery......	1	1	0
Coombs..............	1	0	1	Moorhead.	1	1	0
Cummins.............	1	1	0	O'Conner.....	1	1	0
Cuscaden	1	1	0	Paddock	1	1	0
" T. C."	1	0	1	Pim..................	2	2	0
Davis	3	1	2	Raw	1	0	1
Durno............... ...	1	1	0	Rawlins	1	0	1
Eakins...............	1	1	0	Richmond	2	2	0
Edgar	1	1	0	Roughton.............	1	0	1
Fowler..............	1	1	0	Russell.......	1	1	0
Frazer	1	1	0	Sheen	1	0	1
Fry (table)..........	17	10	7	Siff..........	1	1	0
Gregg	1	1	0	Smith	1	1	0
Hayward	1	1	0	Stansby.............	2	2	0
Henry........	1	0	1	Steele	1	0	1
Henry..............	1	1	0	Thomas....	4	3	1
Hill	1	1	0	Thomas	1	1	0
Howard	1	1	0	Veitch	1	1	0
Hirst	3	2	1	Walsh....	1	1	0
Johnston	2	2	0	Whittingdale...... ..	1	1	0
Jackson	1	1	0	Williams, C. E........	1	1	0
Kennedy	1	1	0	Williams, J. D	5	4	1
Kershaw	1	1	0	Work	1	0	1
Leask................	1	1	0				

Total, 251 cases, 40 deaths, a mortality of 15.85 per cent.

Summary.

101 cases with bacteriological examination, with 33 deaths, 32.69 per cent.
251 "   without   "   "   " 40 " 15.85 "
Total, 352 cases with 73 deaths, a mortality of 20.74 per cent.

On inquiring as to the results obtained, we find that 279 cases recovered and 73 cases died, a mortality of 20.74 per cent,

which we must admit is not sufficiently low to encourage us to proceed further with its use. It may be urged, perhaps, that we are not justified in drawing conclusions from such statistics, as in many cases bacteriological examinations were not made, and in some instances, at least, the cases were moribund when the serum was administered.

On analyzing the cases thus far reported, we find that eighteen French and German observers treated 70 cases, in which a bacteriological examination had been made and streptococci found, with 24 deaths, or a mortality of 34.28 per cent; and twenty-one English and American observers treated 31 similar cases with 9 deaths, a mortality of 29 per cent, making a total of 101 cases with 32.69 per cent mortality.

We also find that fifteen French observers treated 159 cases without bacteriological examination with 16 deaths, a mortality of 16.65 per cent; while fifty-four American and English observers treated 92 similar cases with 24 deaths, a mortality of 26 per cent, thus making a total of 251 cases, which were not examined bacteriologically, with 15.85 per cent mortality.

It is apparent that the better results in the latter group of cases are due to the fact that in it were included many cases which were not due to streptococcus infection, which in all probability would have recovered without treatment; as it is well known that only a certain proportion of rises of temperature in the puerperium are due to streptococcus infection, Williams having found only 23 streptococcus cases in 91 rises of temperature in the puerperium, 25 per cent, and Krönig 56 in 296 cases, 19 per cent.

We shall probably overestimate the frequency of streptococcus infection in the 251 cases which were not examined bacteriologically, if we calculate that one-third of them were of that nature, which would give 84 such cases. Admitting that practically all the deaths in this series occurred in streptococcus cases, we find 84 such cases, with 40 deaths, or 48 per cent, which is a considerably higher mortality than in the cases in which streptococci were positively demonstrated.

In considering these figures, however, we must remember that many of the reports are based upon one or two severe cases, which the observers treated with serum, while their milder cases recovered without its employment. Such reports would naturally give an exaggerated idea of the mortality and will not be considered.

Accordingly, we shall deal only with the results of those

observers who based their reports upon a considerable number of cases, and we find that seven observers—*i.e.*, Savor, Bar and Tissier, Paté, Queirel, Marmorek, Wallich, and Laran—treated 196 cases, 55 of which were examined bacteriologically, while 141 were not. Of the former 36.36 per cent died, and of the latter only 8.5 per cent. It is accordingly apparent that the results of these observers in the treatment of pure streptococcus cases are not better, but, if anything, rather worse, than those shown by our general statistics.

Another method of obtaining an idea as to the curative value of the serum is to ascertain the opinions of the various authors who have employed it. This we have done with the French and German observers, and we find that fourteen out of the twenty eight express a favorable and the rest an unfavorable opinion concerning it.

Favorable Opinions.	*Unfavorable Opinions.*
Ausset and Rouzé.	Bar and Tissier.
Berthod.	Budin.
Bué.	Dubrisay.
Butin.	Durante and Siron.
Charrin and Roger.	Flandrin.
Jacquart.	Gaulard.
Josué and Hermany.	Martellière and Charpentier.
Ledrain.	Maygrier.
Laran.	Merigot de Treigny.
Laruelle.	Paté.
Lop.	Porak.
Marmorek.	Savor.
Queirel.	Vinay.
Weinstein.	Wallich.

It would accordingly appear that definite conclusions cannot be reached in this manner. But, on considering the reports more closely, we find that this supposition is not correct; for we find that eleven of the fourteen authors, who expressed a favorable opinion, treated only 13 cases altogether; while the other three, Marmorek, Laran, and Queirel, treated 54 cases with 12 deaths, a mortality of 22 per cent. We find, however, that neither Laran nor Queirel examined their cases bacteriologically, and it is more than likely that a large proportion of their cases were not due to streptococcus infection, but to other causes. So that Marmorek is the only author among them whose statistics are of value, and we have already shown that his results leave a great deal to be desired.

The other fourteen observers, on the contrary, state that the serum was useless, and in rare cases even harmful to their patients. Thus, we find that Gaulard attributed the death of one of his patients to the use of the serum, and stated that, while her temperature fell after its administration, she went into a condition of collapse from which she did not rally.

Similar statements were also made by Bar and Tissier, and Charpentier, both of whom also stated that the deleterious effects of the serum may be manifested by painful swellings at the seat of the inoculation, by marked rises of temperature immediately following its use, and that it may lead to abscess formation and give rise to erythema and urticaria a varying length of time after the injection, and in rare instances may cause the death of the patient from collapse.

A number of authors, among whom may be mentioned Dubrisay, Laran, Paté, and Van de Velde, state that abscesses developed at the seat of injection in a number of their cases. Several explanations have been advanced to explain their pro- duction. Van de Velde considers that they are usually due to the presence of streptococci in the serum, which he was able to demonstrate in two out of four samples of Marmorek's serum which he examined. Laran, on the other hand, does not believe that the abscesses are due to the use of a contaminated serum, but rather to a chemotactic influence which it exerts, by which streptococci which are circulating in the blood are attracted to the seat of inoculation. We are not prepared to state which of these explanations is correct; but the fact remains that abscesses very frequently follow its use.

All the authors who have written upon the subject do not agree concerning the deleterious effects of the serum, and we find Savor, Wallich, Weinstein, and others stating that they have employed it in a large number of cases without observing the slightest ill effects from its use. Its innocuousness is par- ticularly demonstrated by the experience of Wallich, who employed it in about 400 cases without observing any untoward symptoms.

In spite of the fact that Wallich has shown that the serum is harmless as far as the patient is concerned, his observations in the Baudelocque clinic in Paris show that it is very inefficient both in the prophylactic and curative treatment of puerperal infection. During the year 1896, he tested the serum upon a large number of cases, and administered it to every patient en- tering the hospital in whom there was the slightest possibility

of infection. He administered serum to 383 women sus-
pected of infection on entrance, but nevertheless 58 of them
developed well-marked infectious symptoms. The total num-
ber of cases of infection which occurred in the hospital during
the year was 179, and the cases which were treated prophylac-
tically constituted 32 per cent of that number.

He also employed the serum, in conjunction with the usual
methods of treatment, in the cases which were definitely in-
fected, and found that the results were no better than in the
years in which it was not used, as the mortality from sepsis
during the years 1895, 1896, and 1897 was 0.18, 0.24, and 0.22
per cent respectively, the serum having been used only in the
latter year.

It is apparent from the figures and the statements which we
have just adduced that the clinical results obtained by the
employment of antistreptococcic serum in the treatment of
puerperal sepsis leave a great deal to be desired, and are ap-
parently no better than before its introduction.

Turning from the purely clinical side, we find that a large
amount of experimental work has been done upon the subject
and that Marmorek's original work has been repeated and
tested by numerous investigators with varying results.

Petruschky, working in the Hygienic Laboratory in Berlin
with streptococci and serum which were furnished him by
Marmorek, arrived at absolutely contradictory conclusions;
and, as a result of his experiments, stated that Marmorek's
serum had shown itself absolutely inefficient in the laboratory
and that its use at the bedside could not be recommended.

Aronsohn, on the other hand, likewise working in Berlin,
conceived a more favorable opinion of Marmorek's work, and
was inclined to believe that Petruschky's results were due to
the fact that he had employed a serum which had become inert
through age. For he stated that he had succeeded in raising
the virulence of streptococci to a very marked degree and had
prepared from them a very efficient antistreptococcic serum.
After putting this aside for a few months, and again experi-
menting with it, he was surprised to find that it was absolutely
inert. But upon preparing a fresh serum from the same strep-
tococcus, he found that it was decidedly efficacious.

Bullock, working in England, found that he could readily
raise the virulence of streptococci and prepare an efficient
serum, but demonstrated at the same time that a serum

prepared from a given streptococcus was not necessarily effective against a streptococcus obtained from a different source.

The streptococcus, as is well known, is an extremely variable organism, and we can all remember the early attempts to make a distinction between the streptococcus pyogenes and the streptococcus of erysipelas. It was gradually demonstrated, however, that these two varieties of streptococcus are essentially the same, and we no longer attempt to distinguish between them.

At the same time, however, there are very marked differences between individual streptococci, which are manifested by their varying virulence, their morphology, their behavior on culture media and toward the various coloring matters.   Thus, one streptococcus may be absolutely inert, while another is intensely virulent.   One streptococcus may grow upon potato, while the majority do not.   And in very rare instances they may decolorize by Gram's method of staining (Etienne, Doléris and Bourges, Nocard and Mollereau).   The difference in morphology is occasionally very marked, so that certain authors have attempted to differentiate the streptococcus longus from the streptococcus brevis, etc.

The general consensus of opinion, however, is that while streptococci may present very marked differences among themselves, they still belong to the same group of organisms, and that we are not justified at present in attempting to divide them into various groups; as it is well known that we can often change the biological properties of individual streptococci and can markedly alter their virulence by appropriate procedures. We accordingly find that Lemoine, Marmorek, Widal and Bezançon, Etienne, and others in France have adopted this view, and Lubarsch in his recent article upon the subject expresses a similar opinion.

While we believe in a general sort of way that all forms of streptococci belong to the same general family, the great bulk of the experimental work upon antistreptococcic serum appears to show that there are marked differences in the behavior of various streptococcus infections when treated with antistreptococcic serum. Thus, for example, Méry and Lorraine, Courmont, Desse, Van de Velde, and others have shown that a serum which is produced from a certain streptococcus may be extremely efficacious against infections due to that particular organism, but absolutely inert against infections produced

by streptococci which have been obtained from other sources. Indeed, Desse and Courmont have shown that in rare instances a serum obtained from a certain streptococcus may predispose an animal to infection with another streptococcus instead of rendering it immune.

Van de Velde goes so far as to state that a serum obtained from an individual streptococcus is of little or no value in the treatment of streptococcus infections, as we possess no means of ascertaining in advance whether the streptococcus in question will be affected by the serum or not. And to overcome this difficulty, he suggests that the serum be prepared, not from a single streptococcus, but from a number of streptococci obtained from different sources; so that its efficiency will not be limited to infections due to a particular variety of streptococcus, but that it may offer some chance of being effective no matter what may be the character of the streptococcus which has given rise to the infection. He has prepared such a serum, and designated it as a serum polyvalent, and recommends its use at the bedside. It appears to us, however, that this is begging the question, and, if his statements are borne out, that the entire doctrine of antistreptococcic serum rests upon so insecure a foundation and is associated with such elements of chance that its employment in clinical work cannot be advocated.

Marmorek, on the other hand, is a marked believer in the unity of streptococci, and believes that a serum which is prepared from one virulent streptococcus will be efficient against all other varieties of that organism. And in this statement he is borne out by the experiments of Bullock, Lemoine, and others.

It is apparent, however, that the doctrine of antistreptococcic serum has received a marked blow from the work of Courmont, Desse, and Van de Velde, and this, taken in connection with the comparatively poor results which have been obtained by its employment in clinical work, does not appear to justify us in recommending its use at the bedside, as it would appear to be necessary to identify the streptococci in any given case and to be provided with an appropriate serum for their treatment.

As far as your Committee can see, the only undisputed point which has thus far been elicited by the work which has been done upon antistreptococcic serum is that Marmorek has provided us with a method by which we can raise the virulence of certain streptococci to an almost inconceivable extent.

After a careful study of the literature, it appears that we are justified in formulating the following conclusions concerning the present status of antistreptococcic serum:

1. Clinical observation has shown that the results obtained by its employment leave a great deal to be desired and apparently indicate that it has little, if any, effect upon the general course of streptococcic puerperal infection.

2. The results of laboratory work have been extremely conflicting and have cast grave doubts upon the entire subject. The serum polyvalent of Van de Velde cannot be considered as a satisfactory solution of the difficulty, as it is impossible to foretell in a given case whether any of the serums composing it will be efficient against the particular streptococcus with which one has to deal.

3. The only positive fact which has thus far been satisfactorily demonstrated is the possibility of markedly increasing the virulence of streptococci by appropriate methods.

Passing from the study of the literature upon the subject to the experience of the members of your Committee in the treatment of undoubted cases of streptococcic puerperal infection, we find that Dr. Williams has treated 23 such cases, Dr. Pryor 14, and Dr. Fry 8 cases. Each of these gentlemen, however, has treated his cases by different methods, Dr. Fry being the only one who has employed antistreptococcic serum. All of the cases were undoubtedly streptococcic in origin, as was demonstrated by the bacteriological examination of the uterine lochia, which were obtained by means of Döderlein's tube.

In this report, we shall give the results of Dr. Williams' work somewhat in detail, and refer for particulars concerning the work of Dr. Pryor and Dr. Fry to their supplementary articles, which are appended to this report.

During the past three years Dr. Williams has examined bacteriologically the uterine lochia of 91 puerperal cases, the examination being made when the temperature reached 101° in the hospital cases and 102° in the out-patient and consultation cases. In this number of cases, streptococci were demonstrated 23 times, 25 per cent. In 16 cases streptococci were present in pure culture; in 2 cases an anaerobic variety of streptococcus was cultivated, and in 5 other cases the streptococcus was associated with other organisms. In these 5 cases the bacteriological findings were as follows:

(1) Streptococcus, colon bacillus, and an unidentified anaerobic bacillus.

(2) Streptococcus, staphylococcus aureus, bacillus typhosus, and bacillus aerogenes capsulatus.

(3) Streptococcus, staphylococcus aureus, colon bacillus, and bacillus aerogenes capsulatus.

(4) Streptococcus and colon bacillus.

(5) Streptococcus, staphylococcus aureus, and an unidentified gas-producing bacillus.

Of the entire 23 cases, the last is the only one which died.

Some idea of the severity of the cases may be obtained from the following table, which shows the highest temperature which was reached in each case: In 4 cases the temperature ranged between 102° and 102.9°; in 6 cases between 103° and 103.9°; in 8 cases between 104° and 104.9°; in 1 case between 105° and 105.9°; in no cases between 106° and 106.9°; and in 2 cases the temperature reached 107°.

None of the cases had peritonitis. All of them presented a more or less marked endometritis, and in 3 cases marked pyemia was present, which was accompanied by abscess formation in various portions of the body, from the pus of which streptococci were cultivated in each instance.

Classifying the cases according to the impression which they made upon us at the bedside, we would say that 10 cases were very sick and caused us considerable apprehension; 6 cases were moderately and 7 cases were only slightly sick.

The treatment which was pursued in these cases was as follows: As soon as the temperature reached 101° F. in the hospital cases, or 102° F. in the outside cases, the uterine lochia were removed by Döderlein's tube under the strictest aseptic precautions. The sterile finger was then introduced into the uterine cavity and its walls carefully palpated. If they were markedly roughened, a probable diagnosis was made of infection with putrefactive organisms, either alone or in combination; while if its walls were smooth to the examining finger, the existence of a streptococcus infection was rendered quite probable. In none of the cases under consideration was enough necrotic material found in the uterine cavity to justify curettage. After examining its interior with the finger, the uterus was douched with four or five litres of sterile salt solution.

The tube containing a sample of the lochia was then taken to the laboratory, where cultures were made. If the presence of streptococci was demonstrated, no further local treatment was employed and the patient left to herself as much as possible.

If her general condition was good, no medicinal treatment was employed. But if the patient showed signs of exhaustion, she was immediately treated with large doses of strychnia and alcohol, together with as vigorous a diet as she could well stand. Indeed, we may say that strychnia and alcohol were used in such doses as to keep the patient almost on the verge of strychnia poisoning and drunkenness.

The result of this method of treatment, as we have already indicated, was one death out of 23 cases, a mortality of 4.35 per cent. In 6 cases the temperature fell immediately after the douching and did not rise again; while in the remainder of the cases it persisted for a varying length of time, and in several of the pyemic cases it lasted for many weeks.

These results apparently show that streptococcic infections in the puerperium tend to spontaneous recovery, and that the results are usually good if the patient be not interfered with.

Of course it may be objected that the above results are of no great value, as the infection in most cases was possibly due to streptococci which possessed but a slight degree of virulence. This objection, however, can hardly be maintained when it is considered that the cases in question were spread over a period of three years, and occurred not only in the hospital, but in outdoor and consultation practice as well. And the fact that 10 of the cases impressed Dr. Williams as being seriously ill also speaks against this supposition.

The inherent tendency of streptococcic puerperal infections toward recovery is also demonstrated by the observations of Krönig, who stated that in 56 consecutive cases of streptococcic infection occurring in Leipzig, which were treated in essentially the same manner as Dr. Williams' cases, the mortality was only 4 per cent; and that in the entire number of streptococcus infections which he had observed, 76 in all, the mortality had only been 8 per cent.

The comparatively benign character of streptococcic puerperal infections is also borne out by the experience of Savor, who, as we have already indicated, treated 15 cases of streptococcic infection with antistreptococcic serum, with 1 death. But in spite of these apparently good results, he stated that he believed that the serum had exerted no appreciable influence upon the course of the disease. He designated 8 of his cases as "severe," 6 as "moderate," and 1 as "mild." While treating these 15 cases with antistreptococcic serum, he also observed 24 other cases of streptococcus infection in Chrobak's clinic, which,

however, had so improved by the time that he had demonstrat-
ed streptococci in his cultures that they did not require further
treatment.   All of these cases ended in recovery, thus making
a series of 39 cases of streptococcic puerperal infection which
were treated by Savor, with 1 death, a mortality of 2.59 per
cent.

On adding together the cases of Krönig, Savor, and Wil-
liams, we obtain a series of 138 cases, in all of which strep-
tococci were demonstrated bacteriologically, with 8 deaths, a
mortality of 5.75 per cent.

These observations appear to indicate that the mortality in
the average case of streptococcic puerperal infection is not any-
thing like so high as is generally believed, and tend to confirm
the supposition of Labadie-Lagrave, who believes that the uni-
versal adoption of anti- and aseptic methods in hospital practice
has rendered the streptococci, with which one ordinarily has
to deal, far less virulent than in the pre-antiseptic days.   And
one cannot help feeling that the bad results, which are fre-
quently observed in these cases, are due more to the treatment
than to the disease itself.

In all probability the series of cases observed by Krönig,
Savor, and Williams did not include the same number of se-
vere infections as did the cases which we have collected in our
tables, in which streptococci were demonstrated and which
were treated by serum.   But it would appear to us that the
former can be very appropriately compared with the cases
which were treated by serum, but in which a bacteriological
examination was not made ; especially as 104 consecutive
cases observed by Wallich were included among them.   In
this entire series of cases, the great majority of which in all
probability were not due to streptococci, the general mortality
was 15.85 per cent, whereas the mortality of the 138 cases in
question was only 5.75 per cent.   And we are inclined to be-
lieve that this marked difference was due, in part at least, to
the difference in the treatment employed in the two groups of
cases.

Dr. Pryor's work was based upon 14 cases, in all of which
careful bacteriological examination showed the presence of
streptococci.   Many of these cases followed abortions, and
only a few occurred after full-term deliveries.   In all of them
the essential method of treatment consisted in a thorough
cleansing and attempted sterilization of the uterine cavity, and
the packing of the pelvic cavity with iodoform gauze in the

attempt to isolate the uterus from the surrounding structures. Fourteen cases were treated in this way, with only 1 death, a mortality of 7 per cent.

Dr. Fry's work, as may be seen from the appended report, was based upon 8 cases, in all of which streptococci were demonstrated, and all were treated by antistreptococcic serum. After a bacteriological diagnosis was made and the administration of serum commenced, all local treatment was suspended. Three of these cases died, a mortality of 37.5 per cent.

These figures, however, must be taken with a certain amount of reserve, as one of the cases was dying when the serum was first administered, and a second apparently died from causes other than streptococcus infection, thus leaving 6 cases which were treated with serum, with 1 death.

The results obtained by members of your Committee in the treatment of streptococcic puerperal infection are of the greatest possible interest and importance. Williams treated his cases with a single large intrauterine douche of sterile salt solution immediately after taking cultures from the uterine cavity, his further treatment consisting in the administration of large doses of strychnia and alcohol, if indicated by the general condition of the patient. Pryor, on the other hand, opened the posterior cul-de-sac and tightly packed the pelvic cavity with large quantities of iodoform gauze, believing that by this means he could practically isolate the uterus and thereby prevent the extension of the infection to the peritoneum. At the same time he gave large quantities of normal salt solution, either subcutaneously or by the bowel. Fry treated his cases by intrauterine douches until the bacteriological diagnosis of streptococcic infection was made, when all further local treatment was stopped and antistreptococcic serum administered.

Each of these observers has apparently obtained good results by different methods of treatment. Dr. Fry believes that the antistreptococcic serum exerted a markedly beneficial action upon several of his cases. Adding their figures together, we find that Williams has treated 23 cases with 1 death; Pryor, 14 cases with 1 death; and Fry, 6 cases with 1 death (not counting the case which was moribund when first seen), making a total of 43 cases with 3 deaths, or 7 per cent.

When compared with the mortality which is usually ob-

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served in puerperal fever, these results appear to be most satisfactory; but, on the other hand, when we recall the statement of Krönig that only 4 per cent of all streptococcic cases die when the patients are practically not treated at all, it would appear that treatment employed by the members of your Committee, whatever it may have been, has not materially influenced the mortality, and the most that we can claim is that we have done our patients no harm by our various methods of treatment.

When we compare our results with those obtained in the total number of cases (352) which were treated by antistreptococcic serum (7 to 20.74 per cent), and to the 101 cases in which streptococci were demonstrated and which were treated with antistreptococcic serum with a mortality of 33 per cent, we are markedly impressed by the high mortality in the cases treated by the serum, and at once attempt to seek an explanation for the marked difference.

On casual consideration it might appear that the high mortality in the latter group of cases was due to the use of the serum.   This supposition, however, must be dismissed as untenable, for the reason that no one, excepting Bar and Tissier, and Gaulard, have observed any more serious results from its employment than the occasional production of local abscesses and certain cutaneous eruptions. Savor and Wallich, who have used it in a series of 15 and 104 cases respectively, state that it can be used without appreciable danger to the patient, and these statements are also confirmed by Dr. Fry's experience.

We believe that the very high mortality in the statistics may be explained in part by the fact that many of the observers employed the serum in a few very severe cases only, instead of using it in a large number of consecutive cases of infection. Of course, it is also possible that they may have had to deal with very exceptionally virulent infections, although it is hardly probable that their cases differed materially from our own; especially as Dr. Williams' 23 cases represent the entire number of streptococcus cases which he saw in three years, with the exception of a few consultation cases which were moribund when first seen and from which cultures were not made.

In view of these considerations, it would appear to us that the most rational explanation for the high mortality in the cases reported in the literature is to be found in the fact that the great majority of the cases upon which the statistics are

based were treated by French observers, who curette the puerperal uterus without the slightest hesitation; and on reading their reports it will be found that the great majority of their cases were so treated. The correctness of this supposition is apparently substantiated by the results obtained by Savor, who treated a series of 15 cases with serum, but without curettage, and lost only 1 case. The mortality in his series is much lower than in any other series of streptococcus cases treated with serum with which we are acquainted; and the only explanation which we can offer for it is that he did not use the curette.

When we consider that in the vast majority of streptococcus infections in the puerperium we have to deal simply with an endometritis, in which, according to Bumm and all subsequent observers, the bulk of the streptococci are in the necrotic superficial portions of the endometrium, and are separated from the muscular wall of the uterus and its lymphatics by a protective wall of leucocytes, which is less and less well developed the greater the virulence of the streptococci, it is very easy to understand that curettage, no matter how carefully done, serves to break down this protective wall and to directly infect the deeper layers of the endometrium and the muscularis, from which the infection rapidly spreads to the peritoneum.

We accordingly believe that the curette is a most dangerous instrument in the treatment of streptococcic endometritis; as it is apparently useless in the virulent forms of the infection in which the streptococci are already within the lymphatics and the muscular wall of the uterus, and often converts mild cases into severe ones.

We also believe that the vast majority of cases of streptococcic infection are due to organisms of slight or mild degrees of virulence and tend to recover if let alone; while, when the infection is due to very virulent organisms, the vast majority of patients will die, no matter what our treatment. And we believe that it is better to leave such patients alone, or to treat them by the methods which we have just indicated, rather than to build false hopes upon the efficacy of curettage and the employment of antistreptococcic serum.

It is unnecessary to add that the prognosis in cases with puerperal peritonitis is almost uniformly fatal, and that no method of treatment with which we are familiar will be of any avail.

Your Committee likewise disapproves of the performance of

hysterectomy for puerperal infection in its acute stages; for, if the operation be done sufficiently early to be of value, we feel convinced that many cases will be operated upon unnecessarily; while if the operation be not performed until it is clearly indicated, the results will be almost uniformly fatal. We do not wish to be understood, however, as condemning the operation in certain chronic cases, for then we simply follow the time-honored surgical maxim, "Where there is pus, go after it."

Your Committee would sum up the results of their studies and observations in the following conclusions:

I. A study of the literature shows that 352 cases of puerperal infection have been treated by many observers, with a mortality of 20.74 per cent; where streptococci were positively demonstrated, the mortality was 33 per cent.

II. Marmorek's claim that his antistreptococcic serum will cure streptococcic puerperal infection does not appear to be substantiated by the results thus far reported.

III. Experimental work has cast grave doubts upon the efficiency of antistreptococcic serum in clinical work, by showing that a serum which is obtained from a given streptococcus may protect an animal from that organism, but may be absolutely inefficient against another streptococcus, and that the number of serums which may be prepared is limited only by the number of varieties of streptococci which may exist.

IV. Thus far the only definite result of Marmorek's work is the development of a method by which we can increase the virulence of certain streptococci to an almost inconceivable extent, so that one hundred billionth of a cubic centimetre of a culture will kill a rabbit.

V. The personal experience of your Committee has shown that the mortality of streptococcus endometritis, if not interfered with, is something less than 5 per cent, and that such cases tend to recover if Nature's work is not undone by too energetic local treatment.

VI. We unhesitatingly condemn curettage and total hysterectomy in streptococcus infections after full-term delivery, and attribute a large part of the excessive mortality in the literature to the former operation.

VII. In puerperal infections a portion of the uterine lochia should be removed by Döderlein's tube for bacteriological examination, and an intrauterine douche of four to five litres of sterile salt solution given just afterward. If the infection be due to streptococci, the uterus should not be touched again, and

the patient be given very large doses of strychnia and alcohol if necessary. If the infection be due to other organisms, repeated douchings and even curettage may be advisable.

VIII. If the infection extends toward the peritoneal cavity, and in gravely septicemic cases, Pryor's method of isolating the uterus by packing the pelvis with iodoform gauze may be of service.

IX. The experience of one of the members of the Committee with antistreptococcus serum has shown that it has no deleterious effect upon the patient, and, therefore, may be tried if desired. But we find nothing in the clinical or experimental literature or in our own experience to indicate that its employment will materially improve the general results in the treatment of streptococcus puerperal infection.

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II.

UPON THE TREATMENT OF PUERPERAL STREPTOCOCCUS INFECTION BY CURETTAGE, THE CUL DE-SAC INCISION, AND THE APPLICATION OF ANTISEPTIC DRESSINGS.

REPORT OF DR. WILLIAM R. PRYOR.

Although I have employed the method for eight years, I excluded from this report all cases in which bacteriological examination has failed to find streptococci in *both* the contents of the uterus and in the pelvic cavity. My report embraces 14 cases in which such infection has been proven. There were many other vaginal sections which showed other pathogenic germs, and other cases of streptococcus infection which were subjected to vaginal hysterectomy. All of these are excluded.

The gravity of puerperal streptococcus infection is directly in proportion to the amount of tissue involved and the state of the uterus at the time of infection. Thus we see that an organ criminally aborted at the third month, with much trauma inflicted upon it, will produce graver symptoms than accompany a similar infection implanted upon a placental tuft in a full-term uterus which has not been bruised.

I am also convinced that there is a marked difference in the virulence of the germ in different epidemics and in different localities.

Inasmuch as streptococcus puerperal infection is essentially a wound infection, it is doing too little to treat the septicemia and ignore the local lesions. And as trauma tends to spread the infection, as well as render the type more grave, operative procedures which do not accomplish the destruction of the invading germs are to be condemned. Curettage alone is preeminently such an operation. The injection of strong antiseptics into the uterus is likewise, and for the same reason, condemned.

The cases reported were subjected to the following treatment:

Where the case warranted delay in operating, I began a careful preparation of the patient, the object of which was to reduce the specific gravity of the urine and lower the per cent of urea and to cleanse the colon. To accomplish this such cases were given high colon enemata of four pints of normal salt solution every eight hours. As a result the temperature and pulse fell.

Case X. Y. Za   1.5 .   Pulse 20 beats.
Case X. Y. Z.   1.2 .   "   18   "
Case U. V.   1.2°.   "   12   "
Case Q R.   2.6 .   "   2   "
Case O. P.   1°.   "   6   " (rose).
Case G. H.   1.4 .   "   16   "
Case A. B.   2.5 .   "   20   "

In the emergency operations the observation of the effect of the saline infusions is masked by the operation; but uniformly in such cases have we observed a decrease in the per cent of urea and in the specific gravity: also, where albumin was present before the operation, we have observed that it either disappeared or was markedly diminished by the infusions of salt solution.

The operation consists in a thorough curettage of the uterus, careful removal of all débris, and irrigation with salt solution; and then a broad incision into Douglas' pouch, the liberation of all adherent organs, the evacuation of all fluids, and the application of enough iodoform gauze to completely fill all portions of the pelvis posterior to the uterus, and tight packing of the uterus by the same material. The curettage is performed as much for the purpose of creating a raw surface which can rapidly absorb iodine as to remove infected tissue.

The cul-de-sac incision seeks the evacuation of all fluids, but the chief object sought is the application of iodoform dressings to all parts of the pelvic peritoneum to secure isolation and sterilization of the infected field.

A strong reaction of iodine is gotten from the urine in an average of five hours after the operation. In cases which show pus the absorption of iodine is not so rapid as in the cases of acute pelvic lymphangitis. and the latter are the grave cases which demand speedy iodism. Two hours after operating iodine has been found in the urine. It is necessary to secure rapid elimination of the iodine. This is obtained in grave cases by intravenous infusion of salt solution, and in all cases by high colon injections of salt solution frequently repeated.

We have determined that a rise in specific gravity does not necessarily show a rise in per cent of urea, but rather indicates the amount of iodine eliminated. The presence of nephritis retards the elimination of iodine, and therefore emphasizes the necessity for intravenous infusion in such cases.

We have found that iodine in the urine causes a precipitate with Fehling's solution in testing for sugar, hence Nylander's.

test for sugar should be used.   In testing fresh urine for iodine we have found the chloroform-nitric-acid test the best and most sensitive qualitative test.

I am unable to precisely state what effect the presence of iodine in the blood has upon the septicemia, but a study of the charts would indicate that more is accomplished by the iodine than a mere sterilization of the pelvis.

In no case, save case I. J., were streptococci found later than the third dressing, and in that case the fifth dressing was free from them.   Our observations have shown that all cocci are destroyed by the method of treatment, but that the colon bacillus remains constantly present.

III.

THE ANTISTREPTOCOCCIC SERUM IN THE TREATMENT OF PUERPERAL SEPSIS.

REPORT OF DR. HENRY D. FRY.

Since the last meeting of the Society further observations have been made regarding the value of antistreptococcic serum in the treatment of puerperal sepsis.   The cases which have come under my observation were met with chiefly in Columbia Lying-in Hospital, and occurred in my service and in that of Drs. J. W. Bovée and J. F. Moran, to whom I am under obligations for the courtesy of being permitted to use their material, and to the pathologist of the institution, Dr. John Carroll, for his careful postmortem and bacteriological examinations.   One case was seen in consultation with Dr. Henry B. Deale, and two occurred in my own clientèle.

In all cases of fever after childbirth, cultures were promptly taken from the uterine cavity with sterilized glass tube and submitted to the bacteriologist.   Infection due to the staphylococcus, colon bacillus, saprophytic germs, etc., was eliminated. and the serum treatment employed only in streptococcic infection, pure or mixed.

The local treatment employed in those cases over which I had personal control was a preliminary and thorough cleansing of the utero-vaginal canal with an antiseptic douche.   The uterine cavity was let alone as soon as the diagnosis of streptococcic infection was made.   The curette was not used unless saprophytic germs were also present.   Puerperal ulcers of the cervix, vagina, or outlet were cauterized.   Vaginal douches of hot sterilized water or boracic acid solutions were given three times

daily. Besides the injection of antistreptococcic serum the
constitutional treatment was limited to stimulating and sus-
taining remedies. The serum treatment was begun as soon as
the diagnosis of streptococcic infection was made. In excep-
tional cases, when the clinical aspect pointed strongly to
streptococcic infection, the treatment was commenced before
knowing the result of the cultures.

CASE I. *Abortion; Sepsis: Streptococci in Pure Culture;
Serum Injections; Panhysterectomy; Death.*—E. M., Amer-
ican, married, age 25 years, Ipara, entered Columbia Hospital
on the evening of July 25, 1898, suffering from uterine pain and
hemorrhage. The history could not be ascertained, but suspi-
cions pointed to a criminal attempt to interfere with gestation.
The perineum and cervix were lacerated, the uterus was large
and soft. the cervix partially dilated, membranes protruding.
Iodoform gauze tampon in the vagina controlled bleeding, and
about three hours after admission she passed a four-months
fetus.

July 26: 9 A.M., pulse 116, temperature 103.8°. Perspired
freely during day and evening; temperature fell to 98.2°.

July 27: 9 A.M., pulse 78, temperature 98°. 10 A.M., chill,
followed by rise of temperature to 104.8°. Curettage and intra-
uterine douche. 4 P.M., pulse 92, temperature 100°. Recur-
rence of chill, and night temperature 105°.

July 28 and 29: Temperature varied from 100.8° to 105°
Vaginal and intrauterine douches administered. Cultures of
intrauterine discharge showed streptococci.

July 30: 10 cubic centimetres of antistreptococcic serum in-
jected at 7:30 P.M. and repeated at midnight.

From this date 10 cubic centimetres of serum were given
each day at noon until August 5. The immediate effect of the
serum was striking. Before administration the patient was
delirious, pulse rapid and feeble, respirations accelerated; there
was a cough, and moist râles were diffused over both lungs
posteriorly. After 20 cubic centimetres had been injected
all symptoms improved and the mind cleared up; pulse
dropped to 76, temperature 98.6°. For the succeeding four
days the pulse varied from 60 to 74, and the temperature from
98° to 100.2°, except two short rises to 103°. From August 6
the excursions of temperature were greater; recurrent chills
were followed by high fever. The serum appeared gradually
to lose its effect, and the patient grew worse. On August 17 it
was discontinued, the patient having received 100 cubic centi-

metres.   Microscopic examination of the blood was negative. August 20 panhysterectomy was performed.   The uterus was enlarged and softened.   The right Fallopian tube near its uterine end was gangrenous, and in the centre of this tissue was an opening large enough to admit the end of the finger.   Tissues friable and hemorrhage difficult to control.   Patient died soon after operation.

Autopsy, about four hours after death.—The skin of the whole body has a sallow, greenish hue; fairly good layer of subcutaneous fat.   Pleural sacs free from fluid; no adhesions between lungs and thoracic wall.   Right lung shows a number of small subpleural petechial hemorrhages upon all of the lobes; the left lung, only a few.   Numerous small infarctions upon the surfaces of both lungs, several recent hemorrhagic infarctions of good size in the middle lobe of the left lung.   A firm, caseous, nodular mass, as large as a small hazelnut, just within the upper lateral margin of the lower lobe, causing inflammatory adhesion to the lobe above, and an interlobar pleurisy with numerous delicate dry adhesions.   Small multilocular cavity at the apex, containing a small amount of thin, dirty-looking, blood-stained material.   Lung slightly edematous throughout.   Pleural surface of the right lung dull from thin layer of fibrinous exudate; lobes united by dry, delicate adhesions similar to those on the left side.   Embolic infarcts on the surfaces of both lungs are slightly raised, of an average diameter of about 8 to 10 millimetres, and the tissue is edematous and inflamed and rises above the cut surface.   This does not apply to the solid red infarcts in the left lung.   Pericardium contains about two ounces of clear, straw-colored serum.   Heart considerably enlarged; right cavities dilated, left contracted.   No marked hypertrophy or atrophy of ventricular walls.   Aortic valves, though competent by the water test, show distinctly raised calcareous plates just above the points of junction of the cusps and between the sinuses of Valsalva.   Each plate occupies an area of about 10 millimetres.   Abdominal cavity contains about a quart of thin, blood-stained, watery fluid.   Omentum injected.   Liver pale and enlarged; the right lobe reaches downward to a point on a level with the junction of the third and fourth lumbar vertebræ. Cut surface is of a brown clay color, shows no markings, bleeds only from the larger vessels, is firm and resistant.   Intestines pale, their mucous membrane generally normal.   A few small hemorrhages of the mucous membrane of the ileum.   Interior of stomach normal.   Both layers of the pelvic peritoneum

dotted with numerous petechial hemorrhages and large areas of extravasation. About three inches of the jejunum invaginated, but easily released. Left kidney a little enlarged, pale, capsule injected, and shows a few punctiform hemorrhages. Tissue extremely pale. Malpighian bodies can be made out with difficulty; pyramids very pale. Right kidney slightly smaller than the left, same general appearances; pyramids almost indistinguishable from the cortex. In both organs the cortex is of a dull clay color and entirely free from markings. Capsules slightly adherent. Spleen enormously enlarged, smooth, and covered with a light layer of lymph. Upon section it is somewhat muddy-looking and of a dull brick-red color, interstitial elements apparently increased. Consistence moderately firm, though easily broken down.

Cultures.—Abdominal cavity : micrococcus in pairs and short chains of four or six; bacillus moderately thick and varying in length, some long threads. Blood: sterile. Bile: small coccus in pairs, some forms lanceolate. Urine: no growth. Liver, kidney, spleen: micrococcus and bacillus same as above. No streptococci were obtained at any time.

CASE II. *Multipara; Abortion; Sepsis; Streptococci in Pure Culture; Hysterectomy; Delayed Use of Serum; Death.* —L. A., white, age 33 years, Vpara, entered Columbia Hospital in the service of Dr. Bovée on August 23, 1898. Last child was born five years ago; has had two miscarriages, the present illness dating from the last miscarriage about three weeks ago. When three or four months pregnant she had attempted to produce a miscarriage by the use of drugs. Failing in this she had consulted a woman, who succeeded by using a sharp instrument.

She suffered from chills, fever, and sweating, and was much worse during the four or five days immediately preceding her admission to the hospital. Pulse on admission 98, temperature 101.8°; tongue badly coated; breath foul; diarrhea. Examination showed the uterus enlarged; cervix softened, gaping, and discharging a profuse, sero-sanguinolent fluid of disagreeable odor. A mass the size of an egg was detected in the right side of the pelvis. Vaginal douches of carbolic acid solution were given every four hours, and the temperature dropped to 99.2° and the pulse to 88.

August 25: 1 P.M., severe chill followed by rise of temperature to 105°.

August 26: Curettage. Secretions from the uterus showed streptococci in pure culture.

August 28: Hysterectomy and double salpingo-oöphorectomy. The pelvis contained eight or ten ounces of serous fluid. Uterus enlarged, tubes swollen and congested. The right tube was more involved, the fimbriæ were congested, and a drop of pus issued from the tubal opening. The tissues being soft and pliable, some difficulty was experienced in controlling bleeding. Gauze drainage was used through the vagina. Patient stood the operation well and remained in fairly good condition during the next twenty-four hours.

August 29: Pulse became rapid in spite of free stimulation. The next day I took charge of the case in Dr. Bovée's absence from the city, and ordered antistreptococcic serum.

August 30: 12 M., 10 cubic centimetres of antistreptococcic serum injected, 5 cubic centimetres given at 9 P.M., and 5 cubic centimetres at 11 P.M.

August 31: 6 A.M., patient died.

Autopsy, five hours after death.—Body warm, well nourished; no rigor mortis. Omentum fatty, congested, and adherent to the small intestines, which were deeply injected and showed numerous ecchymoses. Pelvic cavity contained about eight ounces of blood-stained serous fluid. Pleural sacs contained about the normal amount of fluid. Visceral and parietal membranes deeply injected. Lungs congested and edematous. Cut surfaces exude blood and a purulent-looking fluid. Heart large, cavities distended, left ventricle hypertrophied, insufficiency of pulmonic and aortic valves. Pericardial sac contains no excess of fluid. Liver enlarged, right lobe reaching down to bifurcation of the aorta. Anterior surface mottled, posterior congested. Peritoneal surface of the gall bladder deeply injected, also the under and posterior surfaces of the liver. Spleen deeply congested, enlarged, soft, pulpy consistence, and breaks down easily. Kidneys enlarged, stellate veins congested, cortex increased in thickness and striated. Well-marked parenchymatous degeneration. Pyramids dark and congested. Pelvic glands enlarged and firm. About the head of the pancreas was a considerable amount of pus.

Cultures.—Blood, bile, liver, and kidney: sterile. Spleen: staphylococcus pyogenes aureus.[1] Lungs, and pus in the

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[1] "A possible explanation of the failure to obtain the streptococcus from the spleen is that, the culture being taken on agar slants, a few colonies only may have developed and they may have shown only the staphylococcus forms when stained, as occurs frequently when the streptococcus is cultivated upon the surface of solid media."—DR. CARROLL.

abdominal cavity: streptococcus pyogenes and staphylococcus pyogenes aureus.

CASE III. *Primipara; Labor at Term; Fever Fourth Day; Infection due to Streptococcus; Temperature Normal on Eleventh Day; Relapse; Serum Injections renewed with Negative Result; Recovery.*—(Dr. Deale.) Mrs. S. F. H., age 30, white, primipara; delivered on November 4, 1898, after a short and easy labor, of a healthy female child. Only one examination before delivery and none afterward; no douches given.

November 8: Slight chill, with moderate rise of temperature, 101°.

November 9: Severe chill; temperature rose to 104°. Vaginal douches given.

November 10: Morning temperature, 104°. I saw the case in consultation and took a culture of the uterine discharge. Reported later pure streptococcic infection. Intrauterine irrigation of carbolic acid solution. Five cubic centimetres of serum injected. 10:30 P.M., 103.6°, 5 cubic centimetres of serum administered.

November 11: 8 A.M., temperature 102.4°; 3 P.M., 103.6°; 8 P.M., 102.6°, 10 cubic centimetres of serum. Intrauterine and vaginal douches continued.

November 12: 8 A.M., 102.6°; 3 P.M., 105°. Ten cubic centimetres of serum injected at 3 P.M., repeated at 8 P.M.

November 13: 8 A.M.. 102.4°, 10 cubic centimetres of serum; 8 P.M., 102.6°, 5 cubic centimetres of serum.

November 14: 8 A.M., 99.6°, 10 cubic centimetres of serum; 8 P.M., 100.6°.

November 15: 8 A.M., 98.4°; 8 P.M., 99.8°.

November 16: 8 A.M., 98.5°; 8 P.M., 99.6°.

November 17: 8 A.M., 98.4°; 8 P.M., 100.2°.

November 18: 8 A.M., 103.2°, 10 cubic centimetres of serum injected; 4 P.M., 104.6°.

November 19: 8 A M., 103.6°, 10 cubic centimetres of serum; 4 P.M., 104.2°, 10 cubic centimetres of serum.

November 20: 8 A.M., 103.2°, 10 cubic centimetres of serum; 8 P.M., 102.6°; 12 midnight, 104.2°.

November 21: 8 A.M., 101.8°; 8 P.M., 102.6°.

November 22: 8 A.M., 102.8°; 8 P.M., 103°, 5 cubic centimetres of serum.

November 23: 8 A.M., 103.2°, 10 cubic centimetres of serum; 8 P.M., 103.8°.

November 24: 8 A.M., 103.6°, 10 cubic centimetres of serum; 8 P.M., 104°, 10 cubic centimetres of serum.

November 25: 8 A.M., 104°, 10 cubic centimetres of serum; 4 P.M., 98.5°.

November 26: 8 A.M., 100.8°; 8 P.M., 100°.

November 27: 8 A.M., 97.6°; 8 P.M., 97.6°.

After this date the temperature continued normal or subnormal with uninterrupted convalescence. Douches, both intrauterine and vaginal, were continued for ten days until the irrigating fluid came away perfectly clear.

During the attack the patient's mother, who had assisted in taking care of her, developed a facial erysipelas which yielded to the injections of antistreptococcic serum.

CASE IV. *Normal Labor; Sepsis; Streptococcic Infection; Serum; Relapse; Recovery.*—(Moran.) Mrs. A., American, age 33 years, IIIpara, was delivered at Columbia Hospital November 18, 1898. Labor normal and placenta delivered spontaneously twenty minutes later. No vaginal examination had been made during or after labor.

November 19: 9 A.M., pulse 72, temperature 98°. 10 A.M., severe chill followed by rise of pulse to 128 and temperature to 104°. Headache, vomiting, and severe pain in lower part of abdomen. Culture taken. 7 P.M., pulse 130, temperature 103.8°. Uterus large; intrauterine douche of sterile water.

November 20: 9 A.M., pulse 104, temperature 102.2°. Chilly sensation and rise of temperature to 104°. Bacteriological examination of culture showed pure streptococcic infection. 2 P.M., 10 cubic centimetres of serum injected and same quantity repeated at 7 P.M. Temperature fell to 98°, pulse 80, at noon next day. Fever increasing later. 10 cubic centimetres of serum given at 4 and 6 P.M. At midnight pulse was 88, temperature 102.2°.

November 22: 6 A.M., pulse 84, temperature 100°. 9 A.M., pulse 90, temperature 101.8°; 10 cubic centimetres of serum injected, repeated at 6 P.M. Gradual decline of temperature during the night. 3 A.M., pulse 72, temperature 97.4°.

November 23: Slight rise, and at 9 A.M. temperature was 101.6°; 10 cubic centimetres of serum given. 2 P.M., pulse 102, temperature 104°. Ten cubic centimetres at 6 and 9 P.M. Temperature dropped to normal, and, with the exception of slight rise due to subcutaneous abscess, there was no further trouble.

CASE V. *Primipara; Labor at Term; Fever beginning on Sixth Day; Streptococcus; Serum; Recovery* (Fry).—R.

McP., American, age 20 years, Ipara, admitted to Columbia Hospital November 14, 1898. Delivered November 23 at 2 P.M.

November 25: Culture taken from vagina and cervix showed streptococcus pyogenes. Pulse and temperature satisfactory until the afternoon of November 28 (sixth day), when they registered at 4 P.M. 94 and 102.4° respectively. 8 P.M., serum, 10 cubic centimetres, injected. Temperature ran about 101° for next twenty-four hours.

November 29: 3 A.M., pulse 96, temperature 102.4°. Intrauterine douche of two per cent solution of carbolic acid. 12 M., 10 cubic centimetres of serum administered and repeated at 6 P.M. Temperature gradually dropped until at noon November 30 it was 99.4°. At 6 P.M. it was 100.2°; 10 cubic centimetres serum given. Temperature continued to fall and reached normal at 6 P.M. December 1, 10 cubic centimetres were given, and patient made good recovery.

The only local treatment besides one intrauterine injection was hot vaginal douches of sterilized water three times daily.

CASE VI. *Normal Labor; Fever; Streptococcus and Staphylococcus; Serum; Prompt Recovery.*—(Moran). J.S., American, married, IIpara, admitted to Columbia Hospital December 19, 1898. Patient was in labor when she came in, and at 6 P.M. was delivered. Her condition was satisfactory until

December 22, 4 P.M., when chilly sensations and headache accompanied by rise of pulse and temperature to 112 and 103° respectively. Culture of uterine secretion taken.

December 23: Morning, pulse 110, temperature 102.4°. 11 A.M., 10 cubic centimetres of serum injected. 4 P.M., pulse 112, temperature 103.6°. 8 P.M., 20 cubic centimetres of antistreptococcic serum injected. Temperature dropped promptly and on December 24, 9 A.M., was 99.4°, pulse 88.

Patient made good convalescence. Culture showed streptococcus and staphylococcus.

CASE VII. *Labor Easy; Postpartum Hemorrhage; Sepsis; Streptococcic Infection; Serum; Recovery.*—(Fry.) Mrs. M., white, age 35 years, IIIpara, no miscarriages. Delivered March 15, 1899, at 9:30 P.M. Labor easy and natural; placenta partially adherent and its removal followed by uterine relaxation and hemorrhage. Sterilized gauze inserted *in utero* promptly checked bleeding. Patient passed a comfortable night.

March 16: 7 A.M., pulse 90, temperature 100.2°. Citrate of

magnesia, quinine, vaginal douche of carbolic acid solution. 6 P.M., pulse 106, temperature 103.6°.   Bowels moved.

March 17: Morning, pulse 90, temperature 101.2°; intrauterine douche of carbolic acid solution.   Evening. pulse 106, temperature 103.8°.

March 18: 7 A.M., pulse 98, temperature 101.2°; intrauterine douche.   2 P.M., pulse 100, temperature 103.8° ; intrauterine douche.

March 19: 7 A.M., pulse 100, temperature 103.8°.   Large solid stool.   12 M., intrauterine douche.   Cervix large, soft, and covered with grayish exudate.   Culture taken of uterine discharge.   4 P.M., temperature 104.4° ; injection of 6 cubic centimetres of antistreptococcic serum.   Temperature dropped in a few hours to 101.8°.   9 P.M., temperature had gone up to 103.9°; 6 cubic centimetres of serum injected.

March 20: 7 A.M., pulse 100, temperature 101.8° ; serum injection of 10 cubic centimetres.   3 P.M., pulse 100, temperature 103.8°; 8 cubic centimetres injected.

March 21: 7 A.M., pulse 96, temperature 101°.   4 P.M., pulse 106, temperature 103°.

March 22: 7 A.M., temperature 100°.   9 P.M , pulse 78, temperature 99°.

March 23: Temperature normal.

After the first injection of serum local treatment was discontinued, except to use vaginal douches of boracic acid solution.   Report of bacteriological examination of the secretion from the uterus showed streptococcus in pure culture.

CASE VIII.   *Primipara; Labor at Term; Acute Sepsis; Streptococcic Infection; Serum Injection; Death in Twenty-four Hours.*—(Fry.)   M. de S., primipara, age 26 years, native of Switzerland, passed through her gestation satisfactorily.   External examination at eighth month revealed normal pelvic measurements; head well engaged in the pelvic cavity in R. O. P. position.

Labor began on the evening of April 10, 1899.   Pains during the night of moderate severity.   April 11, 8 A.M.: Dilatation about the size of silver half-dollar.   Membranes ruptured spontaneously.   Pains increased, and at 1 P.M. dilatation nearly completed.   Flexion of head imperfect and no disposition to anterior rotation of the occiput.   Under chloroform narcosis the head was rotated manually, but soon returned again to occipito-posterior.   Manual rotation repeated and forceps applied.   At 2 P.M. head delivered readily; no laceration

of perineum. Placenta expelled by Credé method twenty minutes after the birth of the child. Uterus firmly retracted. Patient's pulse 64. April 12: Passed a comfortable night. At 7 A.M. vomiting set in, followed by diarrhea. Marked depression of circulation; pulse rapid and feeble; cyanosis of lips and extremities; conjunctivæ injected. Strychnia hypodermatically and whiskey freely by mouth. Pulse 140, temperature 100.8°. 1 P.M., heart's action depressed in spite of free stimulation; cyanosis marked; dyspnea. Culture from uterine cavity. Intrauterine douche of two per cent solution of carbolic acid. Scarlatinaform rash over chest and back; some pharyngitis Pulse rapid and feeble; temperature ran about two degrees above normal. Twenty cubic centimetres of antistreptococcic serum injected. The eruption extended down the back and over the thighs. Patient took and retained whiskey in large quantities. Strychnia kept up by hypodermatic injections. Exhaustion increased, and patient died at 7 A.M. April 13.

The culture showed pure streptococcus.

The labor had been conducted under rigid antiseptic precautions. The patient had had a soap and warm-water bath at the onset of labor. The genitalia had been washed with bichloride solution, and a moist bichloride dressing was kept applied to the vulva throughout the labor. The hands had been prepared at each examination—scrubbed with soap and hot water, immersed in saturated solutions of permanganate of potassium, of oxalic acid. and finally in bichloride solution 1 : 1000. The forceps had been carefully sterilized. It is open to suspicion whether scarlet-fever poison may not have entered as a factor in the case, as slight evidence existed of exposure to contagion.

Summary.—The report of 8 cases of infection from the streptococcus is here recorded. Two occurred after criminal abortion and 6 after labor at full term. Of the 8 cases 3 died and 5 recovered. Two of the fatal cases followed infection from criminal abortion; both had been curetted and afterward subjected to total hysterectomy. The remaining fatal case was one of fulminating sepsis.

Case 1 apparently improved after the injection of 20 cubic centimetres of serum, begun on the fifth day after the disease. During the first seven days 50 cubic centimetres were administered with satisfactory result. No streptococci were found in the cultures made post mortem. The recurrent fever did not

respond to the further use of the serum, probably because it was due to secondary infection from the bacillus of putrefaction. This bacillus was found in cultures, made after death, from the abdominal cavity, liver, kidney, and spleen. At the operation the site of infection was shown by the destructive effect upon the tissues, producing gangrene and perforation of the uterine end of the right Fallopian tube. It is evident that the infection with the bacillus occurred after the culture was taken from the uterine cavity on the fourth day and was introduced during the intrauterine irrigation.

In Case 2 the culture showed pure streptococcus. The infection had existed for three weeks before coming under observation. The serum treatment was begun only eighteen hours before death. The staphylococcus pyogenes aureus was not found in the culture taken from the uterus, but was discovered post mortem in the organs and in the pus in the abdominal cavity. It was probably introduced during the surgical operation. Streptococci were found in the lungs and in the pus in the abdominal cavity, demonstrating that the serum had not had sufficient time to destroy them.

Cases 5 and 7 were evidently pure streptococcic infection. In Case 5 the streptococcus was found in cultures from the vagina and uterus on the second day after labor and four days before the development of infection. Serum injections were begun on the first day, and 50 cubic centimetres in all were administered. The temperature declined steadily and reached normal on the fourth day. One intrauterine irrigation was given on the first day, and afterward three vaginal douches daily of hot sterilized water.

In Case 7 the culture was taken on the fourth day and serum injections begun at the same time; 30 cubic centimetres were injected. The temperature dropped to normal in three days. The uterine cavity was irrigated with a two per cent solution of carbolic acid four times, and vaginal douches of boric acid solution were kept up daily during the treatment. The effect of the intrauterine irrigation was negative, and it was discontinued after the fourth day, when the serum treatment was commenced.

Case 6 was practically pure streptococcic infection. The staphylococcus found in culture with it was evidently not pathogenic. The serum treatment was begun the latter part of the first day, and the pulse and temperature fell to normal in forty-eight hours. The total amount of serum injected was 30 cubic centimetres.

Cases 3 and 4 responded at first to serum injections, the temperature falling to normal in twenty-four hours in Case 4, and on the fourth day of treatment in Case 3. Relapse oc- curred immediately in the former case, and fever lasted three days longer. In the other, recurrence of fever lasting ten days was preceded by a normal temperature for three mornings, with slight evening elevations. The reports of the culture of the uterus were pure streptococcic infection in both cases. A pos- sible explanation is that the serum antagonized the strepto- coccic infection represented by the primary fever in each case, and that the relapses were due to secondary infections, over which the antistreptococcic serum exerted no controlling in- fluence.

If this conclusion be correct it points to the importance of repeating the cultures made from the uterine cavity in such cases, with a view of determining, first, whether the serum in- jections have destroyed the streptococci; second, whether the recurrent fever be due to secondary infection, and, if so, to ascertain the nature of the infecting agent. The danger of intrauterine treatment in cases of pure streptococcic infection is also emphasized by these cases. The strictest antiseptic precautions are necessary to avoid the introduction of second- ary infection. Curettage is contraindicated in pure strepto- coccic infection. If any benefit is to be derived from the use of antistreptococcic serum in a given case of infection, it will respond to the injection of 20 to 30 cubic centimetres of serum, and from 30 to 50 cubic centimetres will control responsive cases if treatment be commenced early.

THE USE OF THE RENAL CATHETER IN DETERMINING THE SEAT OF OBSCURE PAIN IN THE SIDE.[1]

BY

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FOR about twelve years I found the renal catheter of extra- ordinary value in separating the urines from the right and left kidneys and so in comparing and differentiating the conditions of these organs. The renal catheter has also other important

[1] Read before the American Gynecological Society, May 24, 1899.

features which are equally positive in their value—for example, the wax tipped catheter with its shining surface is scratched when it comes in contact with a stone in the kidney or ureter, and when examined under a common hand lens the tell-tale marks, which could be produced in no other way, are plainly seen. When caught in a stricture the bite of the stricture is easily felt and the catheter moved with difficulty, so that a diagnosis can at once be made. In cases of pyelitis the slightest touch with the end of the catheter is apt to provoke a free capillary hemorrhage, which does not occur under ordinary conditions, and hence has a positive diagnostic value.

Further than these uses, the contact of the end of the catheter with the pelvis of the kidney sometimes produces pain, and the patient is at once able to say that the location of the pain is the same as, or differs from, the pain she has previously felt. I have found this last point of value in a number of instances.

I now wish to bring forward a method of determining the source of obscure pain in the right or left side between the brim of the pelvis and the costal margins. All attentive observers are familiar with cases that go from physician to physician, complaining of a side-ache, the nature of which may not be determined for a number of years, when it turns out to be a gall stone, a renal calculus, some localized affection of the colon, or disease of the vermiform appendix.

I have found out that I could clear up many of these obscure cases in the following manner: The patient is put in the knee-breast position and the renal catheter introduced as far as the pelvis of the kidney; then from ten to fifteen cubic centimetres of a bland fluid are injected rapidly into the kidney with the idea of suddenly distending the pelvis and bringing on an artificial renal colic. This is easily done in all cases. Care must be taken not to produce too violent a colic, lest the patient suffer so much pain that she cannot satisfactorily answer questions. As soon as she feels the pain she will be able to locate it with her finger and to say whether or not it is similar in character to, or in the same position as, the pains of which she has previously complained. The answers to these questions are usually of a most definite and satisfactory character.

In one of my cases, in which I had been utterly nonplussed for more than a year and been unable to come to any definite decision as to the exact seat of an obscure lateral pain, the patient at once positively affirmed that the suffering was in the same place as, and of a similar character to, that artificially

induced. I then made an incision, cutting through the kidney, and found a large, dilated pelvis, showing that the patient had been suffering from an intermittent hydronephrosis, not, however, large enough to produce a palpable tumor.

In another case, seen by some five other consultants, there was a tumor over the position of the kidney on the right side. Some of the consultants decided that it was a gall bladder, while others believed that it was an enlarged kidney. The question was set at rest to the satisfaction of all by the induction of renal colic and the fact that the patient very definitely and positively declared that the new pain was in an entirely different position and not at all in the mass in front; she located the new pain by pressing with her thumb in the angle between the last rib and quadratus muscle. In another instance I was inclined to doubt the testimony of the catheter used in this way, as I thought that a large mass on the right side was so plainly a right kidney that I was disinclined to accept the statement of the patient, who said that the pain was well in her back and not at all in the lump which she felt in front. I made, however, some concessions to her statements in making an incision anteriorly above the umbilicus in the median line; through this incision I then palpated the left kidney and found it normal. On turning to the right side I found that the mass in front was a greatly distended gall bladder containing five hundred stones and that it was adherent over a right kidney which was placed low down on the side. The mass appeared as one tumor upon palpation, and I had been correct in my surmise that it included the kidney. The testimony of the catheter, however, was more correct in showing the kidney was not the diseased organ. In cases of hydronephrosis of larger size the catheter may be used not only to provoke one of the intermittent attacks, but to cause the formation of a palpable tumor, so as to avoid unnecessary delays in arriving at a diagnosis while waiting for an attack to come on spontaneously.

The following list comprises all the cases in which I have utilized this plan of making a diagnosis.

The first case was that of a woman 56 years of age and married (Mrs. T.). The patient, besides suffering from extreme nervousness, complained of sharp, deep-seated pain of three years' duration in the left side, and, on being asked to exactly localize this pain, placed her hand on the left flank, anterior to the anterior margin of the left quadratus muscle and inferior to the costal margin; the pain was deep-seated and superficially

the area was not tender.   The patient, without anesthesia, was placed in the knee-breast position, and the left ureter was catheterized, a wax-tipped catheter being used to determine the presence or absence of renal calculus.

As soon as the catheter tip reached the renal pelvis the patient immediately stated that the seat of pain had been reached.   Slightly moving the catheter tip caused considerable hemorrhage, suggesting a congested condition of the pelvic mucosa.

Twenty cubic centimetres of boracic acid solution were then injected into the pelvis of the kidney through the catheter, and during the latter half of the injection the patient suffered extreme pain, which she described as being of the same nature and in exactly the same spot as the pain experienced during the attacks from which she suffered.

The urine obtained by catheter was normal, except for the rather large quantity of red blood cells present, due to trauma. The cultures made from the urine were negative.   The wax on the tip of the catheter was not scratched, showing that stone was not present.

An exploratory nephrotomy was performed in the case; the kidney was found quite markedly congested and a piece was removed for diagnosis, and the kidney was then stitched into its proper position, a small piece of gauze being used as a drain, due to the excessive hemorrhage.   The pelvic organs were found to be normal.   Result, marked improvement.

The second case was of great interest because of the extremely indefinite nature of the pain.   The patient (Mrs. S.) was 36 years old, had been married seventeen years and had had neither children nor miscarriages; she had never felt healthy since marriage, but the special complaint consisted of attacks of extremely severe pain in the right lower abdomen, extending from the middle line in front to the middle line behind.   These attacks came on at first every three or four months, but recently had appeared much more frequently; they had lasted for three years in all, were especially liable to be brought on after hard work, and bore no relation to the menstrual periods.

The pain was extremely sharp and sticking, and after the attacks the urine was rather red in color, and micturition was accompanied by a burning sensation; no stone or gravel at any time had been passed.   Injection of fifteen cubic centimetres of fluid through the renal catheter into the pelvis of the kidney brought on a sharp attack of pain, but the patient emphatically

stated that the pain was utterly different, both as regards character and location, from the attacks of pain from which she had suffered. Further examination of the patient seemed to show that the pain was more superficial than originally thought, and on careful questioning it was seen to be definitely located along the right circumflex iliac nerve, both branches being affected. Careful testing in the region of the pain showed that the area along the course of the nerve was definitely hyperesthetic. The case thus seemed definitely a neuralgia of the circumflex iliac nerve, and the cutting of the nerve was advised.

The third case (Mrs. S.) had had two severe attacks of pain in the right flank, the first four years ago, just after the birth of her child, the second two years ago after exposure to cold and violent exertion. The pain seemed to start in the right flank, running thence down the right side, about following the course of the ureter. She thought that some blood had been passed during the attacks, but she was sure neither stone nor gravel had been voided. The urine, on the patient's admission to the hospital, was normal.

The right ureter was catheterized, and as soon as the tip reached the pelvis of the kidney the patient immediately stated that the point had been reached where the pain had been worse in her two attacks. There was no evidence of renal stone. Within twenty-four hours after the catheterization the patient's temperature began to rise, she commenced to have pain in the right flank, rapidly becoming worse, so that morphia was necessary in order to give the patient any rest.

She then had an attack which she described as being exactly like the two previous attacks—excruciating pain in the right flank, extending down to the bladder, nausea and vomiting, and marked rise of temperature, reaching 102°. Examination of the urine showed some red blood cells, a trace of albumin, and a large number of pus cells, with the passage of a very small amount during the twenty-four hours. The patient was put on a liquid diet, made to drink large quantities of fluids, and was given mild saline diuretics, and the condition rapidly improved; within three days the patient was able to be about, the temperature had fallen to normal, and there was only an occasional pus cell seen in the urine.

This case is of interest because the catheterization of the ureter called forth a definite attack lasting several days and *exactly* simulating the two previous attacks. Also, by its

means the diagnosis was cleared up, the condition evidently being a focus of infection in the kidney, latent for most of the time, but started up by the process of catheterization.

The fourth case (Mrs. W.) had complained of dull pain under the right costal margin since the birth of her first child (twenty-five years ago). Shortly after the onset of this pain, which was usually cramp-like in nature, she noticed a small movable lump below the right costal margin.

The dull pain in this region lasted, but it has only been during the past five months that the cramps have been of a severe nature, and during this time the lump has seemed to have increased in size and to have become less movable. The digestion, micturition, and defecation have been normal, and there have been no jaundice at any time, no gastric symptoms, and no evidences of Dietl's crises.

By palpation of the abdomen a mass was felt with a sharp edge in the right upper abdominal region, and by percussion the dulness over this mass was seen to be continuous with the liver dulness.

The right ureter was catheterized and a small quantity of fluid was injected into the renal pelvis; an attack of colic was brought on, but the patient stated that the pain in this attack was behind the locality of her constant pain and much further back.

The examination of the urine was negative. Even then the opinion was held that the tumor was probably of the kidney; but an incision opening the peritoneal cavity showed that this was not the case, but that the source of the trouble was a gall bladder filled with stones, adherent to the colon *and to the lower pole of the right kidney.*

The gall bladder was sutured to the abdominal wall and opened; the stones were removed and a gauze drain inserted.

This case is of especial interest because of the intimate anatomical relationship between gall bladder and kidney, which would have rendered a diagnosis impossible without the aid of the renal catheter.

The fifth case (Mrs. P.) had suffered for a year with frequently recurring attacks of pain in the right flank, which were at first thought to be appendicular in origin. The pain was stabbing in nature, "as if a knife were being thrust through her," and was most severe in the right inguinal region; nausea, vomiting, and an intense desire to urinate were associated with the above symptoms. There was, however, with the

intense desire to urinate, a complete inability to do so for some
time. Since the first attack there have been recurrences every
two to three weeks.

The ureter (right) was catheterized, a wax-tipped catheter
being used, and an attack brought on of exactly the same
nature and in precisely the same location as the pain of the
attacks. A small scratch mark was seen on the wax of the
tip, which suggested the possibility of stone; but the catheter-
ization had been so painful that a "control catheterization"
could not be carried out and the presence or absence of stone
definitely determined. An exploratory incision was made and
the kidney found to be movable. The kidney was opened and
its pelvis explored, but no calculus was found. The kidney
was then stitched to the right hypochondriac wall and a small
gauze drain used to control the bleeding. The healing was
perfect. and on discharge the patient stated that she felt better
than she had for a year past.

The sixth case was an emaciated elderly woman seen in con-
sultation with Dr. Biedler and several other gentlemen. She
had a hard mass on the right side at a point about two inches
below the ribs. It could not be determined from the history
or physical examination what was the exact nature of the
tumor, but the general conclusion was reached that it was
either a gall bladder or a kidney. I returned to the patient
in a few hours, and with the aid of Dr. Biedler passed the
renal catheter into the renal pelvis by candle-light and in-
jected a weak boric acid solution, about ten cubic centimetres,
and produced a sharp renal colic. The patient located the
pain at once in the back under the ribs, and positively excluded
the organ which we so plainly felt in front from any participa-
tion in the pain.

1418 EUTAW PLACE.

DIAGNOSTIC CURETTAGE.

BY

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IN spite of the boasted brilliancy of recent microscopic tech-
nique, the pathologic friends of diagnostic curettage have not
been able to lift this procedure to the plane of scientific accep-
tation. Even in cases of suspected malignant uterine disease

digital exploration still has approval as the best of pertinent diagnostic measures.

Curettement as a means of diagnosis can count a few sporadic friends. Its foes are legionary. They may be classified for contemplation into two groups. The first is made up of those gynecologic routinists who, in deference to an over-refined sense of delicacy, or from sheer indifference to the less salient details of diagnosis, prefer not to explore the malodorous and unsightly matter vented from the diseased uterus or vagina, and who turn likewise unmindfully from the examination of feces, pus, and sputum.

Hyrtl, the Viennese anatomist, discoursing upon the physiology of excretion, observes: ''These functions, from foolish expectoration to natural defecation, are ugly and revolting ; therefore, despite their indispensableness, few persons excepting physicians and patients speak of them.

'' The grateful impression which the beholding of a beautifully developed human form tends to make upon one, is lost immediately one connects the form in fancy with excretion. Then all illusions cease. Think of Zeus Olympus upon the cloud throne, in his hand a cuspidor replacing the thunderbolt ; of sweet-eyed Juno blowing her nose ; of a belching Ganymede; of Adonis surrounded with expelled intestinal gas; of a sweating Vulcan; of Achilles wrestling with a hard, unyielding stool; of a sleeping Endymion *cum profluvio seminis nocturno;* of a laboring Pallas Athene with flabby, pendulous paunch; of the virgin Queen of the Night in parturient bed with streaming lochia; of Venus Anadyomene with shame parts bestreaked with menstrual discharge. It were, perhaps, more esthetic had these functions been left apart from the make-up of God's image; but their creation came to pass, and we have no other recourse than to thank God if they continue to operate in healthful harmony.''

Some of the most prized of scientific riches, riches surpassing those of Ormuz or of Ind, have been gleaned in exploration of the unpicturesque excreta. The modern medicine, of which we haughtily own ourselves disciples, has bulwarked itself with facts picked up on excursions of research in sputum, pus, and urine. In the feces new worlds of scientific wealth await a heroic Columbus; and in uterine curettings, however homely they may appear to barbarian eyes, are pathologic pictures which charm the appreciative seeker, and which are of incalculable worth since they indicate the way to rational therapy.

The second class embraces those who use the utmost pains to gather diagnostic evidence, but who deem the examination of curetted material to this end a matter of small importance, preferring to contemplate the clinical symptoms and to examine locally with the speculum and finger.

Preliminary dilatation of the cervical canal sufficient to allow passage of an exploring finger is not unaccompanied by danger; indeed, fatal shock has been reported as its result. Curettement is the less heroic method, even with the possible attendant risk of perforation and peritonitis. Anesthesia is unnecessary, and with the aid of a rapid method of sectioning and staining like that of Thomas S. Cullen, of Johns Hopkins, the diagnosis may be made at a single sitting. Under some circumstances, as in the case of virgins, narrow senile vagina, elongatio colli, or fibroid uterus, digital intrauterine exploration may be impossible. The finger cannot always distinguish benign from malignant neoplasms, but the removal of tissue with the curette leads to positive decision.

Without introduction of the finger into the cavum uteri, fragments of endometrium may be removed by the sharp spoon, and a decision, at least as to the character of the piece examined, may be made; and with practice the condition of the entire endometrium may be determined with the microscope.

The procedure is indisputably indicated whenever suspicion of carcinoma or sarcoma exists; and this suspicion, it will be conceded, is well grounded whenever, in spite of well-directed treatment, recurring hemorrhages from the uterus present themselves at or near the time of the menopause.

In removing tissue by the curette for examination, it should be remembered that malignant disease generally has its beginning in the mucosa and that its location is indicated by unevenness of the surface. The pieces, therefore, should be taken from these roughened areas. Wherever allowable the cervical canal should be dilated to a diameter of about five millimetres. The curette or sharp spoon glides in easily, and with short, vigorous movements scrapings may be taken from the suspicious spot or from the entire endometrium as desired.

The manner of preparation for the microscope which has proved most useful is Ludwig Pick's modification of the method of Thomas S. Cullen, of Johns Hopkins University. The technique is as practicable in any physician's office as in an expensively equipped laboratory. The procedure has already

been described in this JOURNAL and is briefly as follows: The piece of tissue to be examined is brought directly from the operator's knife or curette on to the table of the Jungs–Höbel freezing microtome. This instrument is the '' simplest cutting apparatus imaginable.'' It consists of a steel cylinder through which an ether spray plays on the under surface of a metal platform of about the diameter and thickness of a half-dollar piece. The knife, the exact counterpart of a carpenter's plane, is set at right angles to the cylinder, in the short arm of a lever. In placing the tissue upon the microtome care should be taken that the knife cut vertically to the surface of the mucosa. (The microtome costs, in Germany, seven dollars.)

After cutting, each section is wiped off the knife blade with the finger tip and floated into a four per cent formalin solution. After hardening for four minutes in the formalin, the sections are rinsed in water and brought for four minutes into four per cent alum carmine. Then, after again rinsing with water, they are placed successively in eighty per cent alcohol, absolute alcohol, and xylol, remaining four minutes in each. The sections are then ready to mount in Canada balsam.

By the employment of the four per cent aqueous formalin solution, the difficulties otherwise incident to the management and study of frozen preparations (such as shrivelling, friability, falling out of important parts of tissue rich in cells, and imperfect translucency) are done away with at a single stroke. The formalin hardens the sections and gives the desired toughness without shrinking.

Specimens prepared according to Pick's technique render for diagnostic purposes very satisfactory service—for example, in the diagnosis of neoplasms, inflammations, and erosions. Although treated with but one stain, the alum carmine, the sections show in the different tissues different shades of color, so that in point of distinctness they are hardly inferior to the more elaborately and tediously prepared electively stained specimens. The preparations are so durable that they may be kept for years.

The most appreciated service of diagnostic curettement, as was stated, consists in the distinguishing of benign from malignant conditions. In benign diseases we find the normal elements of the endometrium, intercellular substance, connective-tissue cells of round and fusiform shape, and glands with a single layer of epithelium.

Abortus is characterized by the large decidua cells and the

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general spongy structure, the sponginess being due to the presence of the large lymph spaces. Absence of connective tissue or epithelial infiltration of the same, metamorphosis of the cylindrical epithelium of the glands, the presence of giant cells or of other complex elements and the appearance of cancer pearls, the concentrically arranged masses of flat epithelium, indicate malignancy.

Veit h s said that in rendering an opinion, for example, to the surgeon who has sent for examination a piece of tissue, one of three expressions may be chosen—benign, doubtful, or malignant.

Every man who approaches the examination of curetted matter must lay it upon his conscience to strive to give consistently one of these opinions. If the opinion be that it is malignant, then clinical evidence must help to locate the point of origin and extension of the malignant disease. The method described serves only for qualitative diagnosis. After the microscopist's positive answer, "malignancy," it becomes the duty of the surgeon to remove all the involved tissue, if this still be possible. The opinion "doubtful" means the procuring of new material for examination and further clinical observations. The diagnosis "doubtful" will be given, however, by a careful pathologist only after all of the accessible material for examination has been exhausted. The diagnosis "benign" is given when the normal characteristic tissue elements of the endometrium and underlying structures are preserved. It is to be remembered that it is a duty of him who takes the tissue from the uterus for examination to see that it comes from the most malignant or suspicious spot, since the pathologist can only answer for that tissue which he has examined.

Some information may be gathered from examination of the curetted matter in the gross specimen. Color, consistence, odor, quantity, and the character of the surface should all be recorded. The cellular composition of the tissue, however, and its deviations from the normal, cannot be accurately determined without the microscope.

No intelligent examination of curetted specimens is possible without a thorough understanding of the histology of the standard of comparison, the normal uterine mucosa; therefore the following salient histologic facts must be borne prominently in mind: The cervical mucosa is covered with delicate cylindrical epithelium. The surface is thrown into inundations. Indigitations of this mucosa form the crypts and glands,

some acinous, some bottle-shaped, all lined with beautiful decorative epithelium. A third variety of glands, the tubular glands, are single or double, or sometimes branching like deer antlers. The epithelium in these glands is tall and narrow. Upon the surface mucosa the cells are somewhat shorter. The nuclei occupy a basal position and take up the aniline dyes greedily. After the menopause the mucosa here is somewhat less corrugated, and many of the gland-forming indigitations are obliterated by occlusion of the neck, the cavity of the gland persisting as a cyst. The point of union of this cylindrical epithelium with the flat epithelium of the vaginal portio varies with age, but in ripe sexual life it generally occurs at the orificium externum. The so-called pitcher-shaped cells, which are sometimes counted among the normal elements of the cervical mucosa, represent pathologic metamorphosis of the ordinary cervical epithelium and are not to be considered as normal cells.

The mucosa of the corpus uteri presents a more smooth sur face, covered everywhere with a single layer of shorter epithelium. The cells here are almost cuboid. The nucleus is oval in contour and occupies the middle of the cell. The glands of the corpus penetrate almost to the muscularis. They are like those of the cervix, except perhaps more worm-like and tortuous. The mucosa of both corpus and cervix lies upon a connective-tissue stroma in which the blood vessels and nerves ramify. The connective-tissue cells are round or fusiform, with great nuclei almost filling the cell bodies.

The round connective-tissue cells resemble lymph corpuscles, which resemblance has led to the designation of this stroma as lymphoid tissue. The intercellular substance is made up of a homogeneous material containing delicate fibres. During menstruation this stroma is markedly edematous. The muscularis is made up of smooth muscle tissue.

The pathologic deviations from this normal structure which diagnostic curettage may reveal may be enumerated as follows: endometritis interstitialis, endometritis decidualis, remnants of abortion, endometritis tuberculosa, endometritis gonorrhoica, endometritis glandularis, glandular polypi, adenoma benignum, adenoma malignum, carcinoma, adenoma carcinomatosum, carcinoma adenomatodes, sarcoma, deciduoma malignum, and echinococcus. Not every endometrial pathologic condition is included in this list. Mention of some is omitted because they contraindicate curettement—for example, endo-

metritis acuta septica; and of others—for example, endometritis dysmenorrhoica, hemorrhagica, and exfoliativa—because they present in examination of fragments no distinguishing peculiarities.

The characteristic changes in interstitial endometritis take place in the stroma, in the subepithelial layer. We find in this condition the connective-tissue cells increased in number and the stroma infiltrated with leucocytes. The acute form may terminate by resorption of the round-celled infiltration (*restitutio ad integrum*); or may become chronic, in which case the glands of this layer are compressed out of existence, the connective-tissue elements are increased, the round connective-tissue cells metamorphosing to the spindle form, and instead of the loose reticulated subepithelial layer we find nothing between epithelium and muscularis but quite dense connective tissue, through which are sprinkled a few glands. In time this connective-tissue layer may become thinner and still more cicatricial or cirrhotic. This is the endometritis of old age, or endometritis interstitialis atrophicans.

Decidual endometritis is always found after an abortion in the early months. The spaces between the large decidua cells show infiltration with polymorphonuclear leucocytes. The diagnosis of remnants of abortion may be made upon the discovery of the chorionic epithelium, the inner layer of which is made up of cuboidal cells, the outer of a homogeneous line of protoplasm dotted with nuclei. This outer layer is known as the syncytium. The interior of a villus is made up of mucoid tissue and is richly supplied with blood vessels. It is not hard to recognize these villi in the curetted mass, as the finger-like prolongations of vascular mucoid tissue covered with the two layers of cells are unlike any other structures.

Diagnosis of tuberculosis of the endometrium is practically impossible without curettement. The usual symptoms—disturbed menstruation, discharge, and enlargement of the uterus—are quite inconstant, and a certain diagnosis can be made only by microscopic examination of curetted matter or excised fragments. The typical tubercles, consisting of giant cells surrounded by epithelioid cells and lymphocytes, are most in evidence in the superficial layers of the stroma, immediately under a pale but intact layer of epithelium. Uterine tuberculosis generally begins high up in the fundus and secondary to a tuberculous tube—a fact to be borne in mind in removing the tissue for examination.

Endometritis gonorrhoica is easily diagnosticated, since its specific germ will be stained with the rest of the section. Its unusual size, its coffee-bean form, and its intercellular grouping are characteristic.

In endometritis glandularis or hyperplastic endometritis, sometimes ridiculously called fungoid endometritis, the investigator finds upon examination a symmetrical hyperplasia of all parts of the mucous membrane. The glands are always increased in number and dilated, as during menstruation. The glands in many cases may be regarded as the sole cause of the hypertrophy of the membrane. In some preparations they are not only dilated, but also elongated. The cross, slanting, and longitudinal sections of these glands fill the field encompassed by the lens. The arrangement of the glands is always typical.

If a circumscribed area of mucosa is much thickened by glandular hyperplasia, we speak of the thickening as a polyp. Now, if this polyp assume proportions entitling it to the dignity of a place among the neoplasms, we speak of it as a benign adenoma, or an adenoma benignum. In a section of adenoma benignum and glandular polyp we discover, therefore, practically the same changes from the normal as in glandular endometritis, all representing simple overgrowths of normal gland tissue, the only difference of kind being that in the last-named there is more copious round-celled infiltration. In the case of adenoma malignum an atypical growth of glands is present The gland lumina wind about in a tortuous, fish-worm-like manner, anastomosing everywhere. In the case of adenoma benignum we distinctly see the basement membrane of each gland supporting a ring of intact epithelium. The single layer of epithelium can be traced from any given point of beginning around the wall of the gland tubule and back to the starting point. If in the adenoma malignum we were to attempt to follow the cross-section ring of the epithelial lining of any gland, tubular or acinous, the eye would be led curling, zig-zagging all over the field, for the reason that the gland lumina anastomose very freely and irregularly.

The adenoma malignum presents a maze of gland cavities lined with several layers of cells. The epithelium is also polymorphous and quite unlike the clean-cut cells of the benign adenoma.

In the case of carcinoma of the uterine mucosa we may find the well-known "figura typica" of carcinoma, showing the thin or thick connective-tissue septa—thin if the carcinoma be

medullary, thick if it be scirrhous—these septa enclosing alveoli in which are scattered the polymorphous epithelium cells.   In carcinoma which has developed from the flat epithelium of the portio vaginalis, we encounter the finger-like prolongations of flat cells dipping down between the papillæ of the epidermis-like covering of the vaginal portio and invading connective-tissue structures in which epithelium does not belong.   We will be sure of our diagnosis of flat-celled portio carcinoma if we find the little bodies so familiar to all students of pathology—the concentrically arranged clumps of flat epithelial cells, the cancer pearls or cancer onions.   The peculiar hyaline cells, which closely resemble budding yeast forms or blastomycetæ, and which Roncali, Sanfelice, Park, and others regard as the etiologic parasites of cancer, may be brought to light by the more or less complicated staining methods developed for this purpose by the investigators named.   It remains to be proved, however, that these structureless bodies do not represent mere degeneration of classical cancer cells.   There is reason to believe that the significance which the Italians have placed upon the presence of these bodies in tumors will be lost, as was the case with the various cocci, bacilli, gregarinæ, coccidia, hematozoa, and amebosporidia which have been presented at different times as the specific etiologic parasites of tumors.

The " figura typica " of carcinoma of the corporeal or cervical mucosa and the cancer pearls of flat-celled uterine carcinoma will not escape the detection of the pathologist of even small experience.   They are discoverable in the very early stages of the disease, when there is still hope that surgery can save life. What may be done in the way of microscopic diagnosis of uterine carcinoma has been perhaps fairly exemplified in the laboratory of Professor Orth, in Göttingen, where in twenty years some 2,300 specimens from suspected cancer of the uterus have been examined, with error in diagnosis in only three instances. In the language of Roswell Park, " What this all means to a given patient may be easily left to the imagination."

If in a neoplasm, the tissue of which is mostly that of the adenoma, a focus is found which is undergoing true carcinomatous degeneration. or where the alveolar "figura typica" is demonstrable, the growth is denominated an adenoma carcinomatosum.

It sometimes happens that the polymorphous epithelium which almost entirely fills the alveoli in carcinoma may be removed from the centre of a few of the cavities by necrosis or

by mechanical violence; and because of the resemblance to gland tissue which this dropping-out of the central epithelium of the alveoli imparts to the carcinoma picture, we speak of such a cancer as a carcinoma adenomatodes.

The diagnosis of sarcoma is difficult to frame from simple examination of curetted fragments: the simple small round celled sarcoma presents a picture so much like that of granulation tissue that it is sometimes impossible to differentiate the one from the other.   The perfectly alveolated sarcoma likewise cannot be distinguished from carcinoma.

If, however, we meet a growth made up for the most part of fusiform connective-tissue cells or giant cells, or both, we may be almost certain of the diagnosis sarcoma.   Clinical evidence is, as a rule, more valuable than microscopic disclosure in pointing out uterine sarcoma, yet many times the microscope has given early diagnosis when the clinical manifestations had not made appearance, as was true in the following well-known case: In the clinic of Professor Landau, in Berlin, a patient was recently anesthetized for the purpose of making a celiomyomectomy.   During the course of the operation the uterus was curetted.   The professor removed some granular, brittle material of suspicious appearance, which was handed to Dr. Pick for examination.   Dr. Pick examined the material by his rapid method and found the microscopic picture of deciduoma malignum, and the uterus was extirpated forthwith under the same anesthesia.   This deciduoma malignum is a peculiar malignant neoplasm of the uterus, described first a few years ago by Sänger.   It appears during or immediately following pregnancy.   It has been regarded as a growth from the decidua, partaking of the character of both sarcoma and carcinoma, and has been designated as deciduoma malignum.   Its place in pathology, however, is not quite certain.   Later investigations have indicated that it is not a neoplasm of the decidua, but of the chorionic villi, and that the syncytium, or the outer of the two layers of epithelial cells which cover the chorion, presents the soil from which it grows.   Being developed from epithelium, and composed of maternal cells from the syncytial layer and of fetal cells from the inner of the two layers of villous epithelium (Langhans' cells), and merely accidentally enveloping a few decidual cells, being therefore an epithelial growth, it should be regarded as a carcinoma and not as a sarcoma.   Without pregnancy the neoplasm is not possible.   The presence of ribbons of homogeneous matter dotted with nuclei, or, in

other words, the presence of syncytial cells, is characteristic of
the syncytioma malignum, deciduoma malignum, or chorio-
carcinoma, as it has been variously called.

In curetted matter from a uterus harboring the echinococcus
there can be found the peculiar vesicles and hooks and suc-
cinic acid.

It is probable that a method of examination like diagnostic
curettage, which demands of the examiner somewhat more than
usual care in the technique of curettement and in the use of
the microscope, will not be universally applied; nor need we
be hypercritical if, after application of the method by a skilful
man, some uncertainties of diagnosis still remain. It may still
be said with truth that of all clinically undiagnosticated cases
the majority may be elucidated with the microscope by one
who regularly embraces every opportunity to examine the nor-
mal and diseased endometrium. The practice which one
receives in examining normal and mildly pathologic conditions
will certainly be of great service when one is called to investi-
gate obscure conditions. The diagnostic curettement is not
more than an auxiliary to clinic and anatomic diagnosis;
therefore, he who takes the tissue from the living woman for
examination, as well as he who uses the microscope, must have
mastered the other and more universally powerful means of
diagnosis. The gynecologist and the gynecologic pathologist
should, if possible, be represented by one man.

In the language of G. Veit, the pathologic anatomy of the
organs peculiar to women is not playfully inserted into the
text books of gynecology. A man cannot be regarded as a
gynecologist because he knows enough to insert his finger into
the vagina or to apply through the speculum this or that rem-
edy. It cannot be denied that if he would meet the universal
demand he must be competent to grasp the knife and operate
at least as well as the general surgeon; and, just so, if any
gynecologist would be regarded as something more than a
routinist, he must know the pathology of the organs with which
he deals, at least as well as the general pathologist.

249 NORTH PENNA. STREET.

TOXICITY OF URINE IN PREGNANCY.
(SECOND PAPER.)

BY

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THE experiments of Bouchard [1] seemed to show that the urine of healthy human beings, when injected into the blood current through the post-auricular veins, was poisonous to rabbits; that the human economy was constantly forming substances of a poisonous nature; that these poisons were being as constantly thrown out of the system by means of the healthy kidneys; that the human being was constantly trying to poison himself. Chambrelent and Dumont [2] showed by similar methods that the urine of women in the last month of pregnancy was also poisonous, but to a less degree than that of the non-pregnant, and Labadie-Lagrave, Boix, and J. Noe [3] claim to have confirmed the last-mentioned results. That there was a poison in the system was apparently demonstrated by the researches of Ludwig and Savor, [4] Tarnier and Chambrelent, [5] and others, which showed that the blood serum of pregnant women was more poisonous than was their urine, and that the serum taken from eclamptics was the most poisonous of all. These demonstrations were apparently so clear that nothing remained but to demonstrate the exact nature of the poison and the whole story of eclampsia would be told. Unfortunately this possible clearing up of so dark a subject received a decided setback from the work of Volhard, [6] who showed that the urine of pregnancy varied so greatly in its toxicity as to throw grave doubts upon all previous work; that the serum of eclamptics was not necessarily more toxic than that of normal pregnancy; and chiefly that the intravenous method of injection of both urine and serum often produced thrombosis of the veins, which of itself was sufficient to cause the death of the animal. Volhard had no doubt, however, that the urine and serum were both poisonous, but seemed inclined to raise the question whether pregnancy increased the toxicity or not.

With the hope of being able to throw some light upon this matter, the author made and published, some two years ago, a

series of experiments, the method of injecting the urine being made in such a way as to obviate the objections which were raised by Volhard. The method was as follows: "The urine was collected (voided by patient) in glass fruit jars (quarts) with screw tops. Into each jar were put two drachms of boric acid (pure). The patients were selected at random, some from the wards of a maternity hospital, some from the beneficiaries of the Cincinnati Maternity Society, and some from the private practice of the writer. They were impressed with the necessity of absolute cleanliness of the genitals before the urine was passed, and of the jars at all times. Except in two experiments the urine was boiled down to one-half, one-third, or even less of the original bulk and then used at once or stored in sterile jars. Whenever it became necessary to keep the urine it was always boiled again before it was injected. After (this second) boiling, the urine was neutralized with sodium bicarbonate and injected into the abdomen, the abdominal wall having first been cleared of hair and scrubbed with bichloride of mercury solution 1 : 500. The urine was injected warm (about 100° F.). In each instance the needle of the hypodermatic syringe was pointed toward the lower extremities of the animal to avoid wounding the liver, diaphragm, etc."' The syringe was of the aspirator- hypodermatic form and permitted the injections to be made without withdrawing the needle. Twelve experiments were made on rabbits with urine taken from six women in last month of pregnancy. This urine, when used in the proportion of from 80 to 100 cubic centimetres of the unconcentrated to kilogramme of animal, always killed, the death being usually preceded by clonic and tonic convulsions. opisthotonos, etc.

Four other experiments were made with urine taken from two non-pregnant women, one of whom was married and had borne children, the other a healthy virgin. This urine acted exactly as did that taken from pregnant women. The con- clusion seemed justifiable that urine of women, pregnant and non-pregnant, married and unmarried, parous and virgin, was toxic, at least to rabbits.

Aside from a small abscess found in the liver of one of the animals, practically no lesions of peritoneum or organs were found upon postmortem examination. It was evident that the poison was very soluble and not irritating, and that the ani- mals did not die of sepsis.

During the year following the time of making these experi- ments others were made under similar precautions and with

similar methods, except that instead of using a syringe the urine was filtered into a graduated burette holding 50 cubic centimetres, and thence thrown by means of atmospheric pressure into the abdomens of rabbits and white mice. The urine was collected during the last month of pregnancy, during labor, and post partum, and was used concentrated and unconcentrated. The mortality was again nearly 100 per cent. The figures are as follows: unconcentrated urine taken during the last month of pregnancy killed seven rabbits and two mice, one mouse recovered; when concentrated it killed two mice and failed with one; when taken during labor, unconcentrated urine killed one rabbit and one mouse and spared none; when taken post partum, the unconcentrated killed two rabbits and one mouse and failed with none.

These experiments left no doubt in my mind that the urine of the last month of pregnancy, of labor, and of the postpartum state was toxic in a high degree; that the poison was soluble and not affected by heat; that boiling and even concentration made no appreciable difference in this toxicity, nor was more poison thrown out of the system after delivery.

Considerable experimentation was now made in the effort to isolate the poison. It seemed rational to suppose that if eighty to one hundred cubic centimetres would kill a kilogramme of animal, it ought to be possible to isolate the poison from one quart of urine. Urine which was proved to be toxic and convulsive was subjected to the method laid down by Vaughn and Novy[*] for the isolation of paraxanthin. After repeated and conscientious efforts, without result, the attempt was abandoned. But while unsuccessful in the isolation of the particular poison, the writer made a discovery which was of considerable importance, as subsequent results showed. One day some fresh urine was injected unchanged and was not poisonous. A new method was now adopted with the object of using fresh urine from pregnant women. The method in detail was as follows: Women were to be near term; the genitals to be thoroughly cleansed with soap and water; the urine to be drawn by sterile catheter into sterile Erlenmyer flasks, which were cotton-stoppered before and after filling; the urine to be immediately boiled and then sent to our laboratory and injected (this was done usually at once, sometimes twelve or more hours later); injections to be made intra-abdominally under same precautions as heretofore, except that the urine was neither neutralized nor filtered. Experiments were made on six rabbits and twelve

mice with urine taken from eight women.* The proportions
used were about the same as those of the previous experiments
(80 to 100 cubic centimetres to kilo); a mouse received 25
minims, as a rule, but in four instances 50 minims were in-
jected into these animals. All of the animals lived except one
mouse which had received 50 minims; it died in twenty-four
hours. The mortality was, therefore: rabbits, nothing; mice,
8 per cent. In addition to these, four other experiments were
made on mice with urine taken from women in labor and one
with that of the postpartum period. All of these mice recov-
ered. Three other animals, one rabbit and two mice, received
injections of urine which was twenty-four hours old; all died.
If these experiments be grouped into classes, it will be found
that of urine boiled at once and used within twenty-four hours
the figures stand: seven rabbits and nineteen mice experi-
mented upon, of which six rabbits and sixteen mice recovered,
a mortality of rabbits 15 per cent; mice, 16 per cent; all ani-
mals together, 15+ per cent. Mortality after urine has stood
for twenty-four hours, 100 per cent. If the experiments made
under the two methods be contrasted a remarkable fact pre-
sents itself—namely, that while urine which has been collected
over boric acid and allowed to stand for from one to four days
shows a mortality of 100 per cent, that which is boiled at once
and used within twenty-four hours shows a mortality of only
15 per cent, and if the latter be used within twelve hours the
mortality is practically nothing.

At this point Dr. F. Forchheimer, whose advice and assist-
ance have at all times been of the greatest value to me, sug-
gested the idea that the poisonous material with which the
urine at times seemed to be impregnated was probably due to
the presence of bacteria and was not necessarily the result of
tissue metamorphosis, as has been claimed by nearly all writers
of the past eight years. He further suggested that the proper
plan to follow was to collect the urine under aseptic precau-
tions and to use it fresh, boiled and filtered, on succeeding days.
Dr. Forchheimer made about one hundred experiments on mice
with urine taken from patients who were suffering from vari-
ous forms of intestinal autointoxication. His results were
embodied in a paper presented to the Association of American
Physicians in May of this year, and showed that urine which

* Dr. Alfred Gaither, Chief Physician to the Miami Maternity Hospital;
Dr Frances Haag, Interne Presbyterian Hospital; and Dr. Joseph E.
Stephan, my assistant, by their kind co-operation, made this work possible.

was taken as already stated, was not toxic when used immediately, but became so with increasing strength as the days succeeded each other.

These facts led me to undertake another series of experiments having for its object the confirmation or controversion of Forchheimer's idea. I used unconcentrated urine from seven women, the majority of whom were in the last month of pregnancy, the others in the postpartum period. The results of these experiments show that fresh, unboiled urine, taken under aseptic precautions during the last month of pregnancy, killed one mouse out of five, or 20 per cent, while fresh, boiled urine killed two mice out of nine, or 22 per cent; that the same unboiled urine, after standing for twenty-four hours in cotton-stoppered sterile flasks, killed all five of the mice, or 100 per cent, while boiled urine which had stood for twenty-four hours in similar flasks killed four out of five mice, or 80 per cent. Owing to a scarcity of animals the urine which had stood for forty-eight hours or longer could not be used. Indeed, if urine which has stood for twenty-four hours kills in such proportions, it would seem useless to carry the experimentation further.

In drawing conclusions from these researches, due appreciation of possible error and of possibly different results by future investigators should prevent me from making sweeping statements. Nevertheless certain things seem to stand out in high relief and to call for comment. If fresh urine does not kill and older urine does, the great variability in the toxicity of the urine of pregnancy may depend wholly upon the time which intervenes between the voiding of urine and its use by investigators. If, from the action of bacteria or retrograde changes of any kind, the urine takes on toxic characters which it did not possess when excreted by the kidneys, a few hours' delay in making the injections may be sufficient to produce these poisons. Every one knows how easy it is for such delay to occur. How easy is it, then, for investigators to find different results, if not to be totally misled by their results !

If urine spoils so quickly it does not seem unreasonable to suppose that blood will also undergo similar changes, for blood must of necessity be collected under less perfect aseptic precautions and be kept for at least twenty-four hours before serum can be obtained from it. If serum undergo the same changes which urine undergoes— and it is difficult to understand why it should not—the matter becomes an exceedingly impor-

tant one when one recalls the fact that nearly all investigators have claimed that there is a definite relationship between urine and serum as to toxicity. Of course experiments must be made with aseptic serum, if such be possible, before dogmatic assertions can be made.

Whatever may be the final word in regard to the nature of the poison, it looks now as if the whole question of the toxemia of pregnancy and the parturient state should be investigated from the beginning. Not one of the women whose urine was used in this work suffered from eclampsia or convulsive attacks of any kind. Some had albumin, occasionally in marked quantities, in the urine; some may have had headaches, one had pronounced vomiting, and many of them had good reason to be nervous and apprehensive because their condition had not the sanction of law or church; and yet the urine was not poisonous when used early. Of course it is possible that in all cases poisons were generated in the systems of these women, and were either thrown out by the intestines, oxidized in the lungs, or destroyed by the liver; but, if so, the kidneys gave no sign.

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VAGINAL CYSTOTOMY FOR THE CURE OF IRRITABLE BLADDER.

BY

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CASE I.—Miss B., age 19 years, was brought from a neighboring town to consult me in regard to a bladder trouble. The family history was reported good, and her parents authorized

the statement that as a girl she was robust and healthy and full of life and energy; also that she was especially fond of dancing, and, in their opinion, this amusement, carried to excess, was the chief cause of her present trouble.

She herself stated that the desire to urinate would of necessity be restrained at times in the ballroom, and that frequency of micturition with pain would occur as a result of this habit. Starting in this way, the attacks grew in frequency and intensity, and without apparent cause, until finally the bladder tenesmus was so great and so constant that she could no longer maintain the erect position, but was compelled to take to bed as the only means of affording even a temporary relief. When I first saw her she had been a bed-ridden invalid for thirteen months. The general health at this time was by no means assuring, on account of loss of appetite, decline in flesh and strength. and marked symptoms of nervous prostration.

She brought a note from her family physician stating that he had tried every known remedy without in the least influencing the course of the disease. The urine was free, pale, slightly phosphatic, with no evidence of cystitis. An examination was made with difficulty, on account of the patient's extreme nervousness as well as the sensitiveness of the parts involved. As she had been treated according to the rules usually laid down in such cases, and by an intelligent physician, I determined to pursue a different and more radical course—viz., make a vesico-vaginal fistula, with the view of giving the sphincter muscle as well as the irritable urethra a much-needed rest. The operation was done under chloroform, and a digital examination made of the entire interior of the bladder, including the vesical neck. Nothing abnormal was found except a highly contracted bladder with thickened walls. The effect of the operation was all that could have been expected, as the patient slept well afterward, expressed herself as feeling better, and was certainly much less nervous than before. As the opening in this case was made with an ordinary bistoury and no precautions were taken against closure, the wound healed up in about two weeks, with a gradual return of the old symptoms. This was feared from the start. and knowing no better way, at the time, of making a fistula that would not heal, I reopened the bladder at the same place with a cautery knife. No further trouble was had, and at the end of seven weeks the ordinary operation for vesico-vaginal fistula was done and the patient returned home. The improvement

following this treatment was in every way satisfactory and absolutely uninterrupted. The woman has since married and has children, and no return of the former trouble.

CASE II.—Mrs. F. was recently seen and presented the following history: At the age of 16 she began to suffer from frequent urination with pain and bladder tenesmus ; was treated, but, receiving no benefit, she was compelled to quit school. For the succeeding five years she suffered a great deal, but was not confined to bed from this cause for any length of time. At the age of 21 the symptoms seemed to show some abatement, and she married. After six weeks of married life the former symptoms returned in a most violent form and she was compelled to take to bed. I first saw the patient eight months after marriage and found she had been confined to bed more than six months of this time. She had been treated during this period with remedies innumerable, as well as a resort to surgical means. One physician had irrigated the bladder, while another had curetted the womb, but these measures not only failed to be of benefit but caused much suffering. She stated that each time the bladder was washed out the pain from the catheter was intolerable and would almost throw her into convulsions. On account of the extreme nervous condition an examination without an anesthetic seemed impossible; but as the patient agreed to this, I determined also, with her consent, to operate at the same time if found necessary. In sounding the bladder the urethral reflexes were quite active, even under profound anesthesia. An opening of about an inch in length was made, as in the first case, midway between the cervix and mouth of urethra, except that in this instance the patency of the opening was insured by stitching the mucous membrane of the bladder to that of the vagina.

Besides the internal use of benzoic acid to correct the alkalinity of the urine, and a few bladder irrigations, no further treatment was used. The improvement in this case was also very marked, as she slept without her accustomed sedatives, appetite improved, and much of the nervousness that characterized her former condition disappeared. The mental improvement was equal to that of the physical, as the patient became much more cheerful and confidently looked forward to a return of health and strength. After an interval of two months the vaginal opening was closed and the urine allowed to pass through the natural channel. I did not use the self-retaining catheter nor adopt the method usually employed of

drawing off the urine every few hours after this last operation. For several days the bladder voided its urine every one or two hours with some burning, but there was absent the intense pain and contraction that formerly attended this act. As this case is quite a recent one, it is a little early to predict a positive result, yet I have every reason to believe that with the greatly improved physical condition the result will be satisfactory.

The objections urged against this operation are its disagreeable features—viz., the constant dribbling of urine through the vagina, as well as the fear in the minds of some that it might be difficult to close the opening. These objections are of minor importance compared to the symptoms of which the patient may complain previous to the operation, and, as the opening is always easy to close, she has the satisfaction of knowing that the discomfort mentioned is only of temporary duration. Besides the physical comfort produced by the operation, the psychical effect is of no mean consideration.

In the case last mentioned several boric acid vaginal douches were used daily to relieve the irritating effect of the urine. Besides this the vulva and inside of thighs were kept well anointed with oxide of zinc salve, and absorbent pads were used and frequently changed. I think this plan preferable to using any form of bladder siphonage, as it avoids irritation and allows the patient to leave her bed.

Our literature on the subject of irritable bladder is meagre and the treatment varied and indefinite. The synonyms are hyperesthesia of the bladder, hysterical bladder, nervous bladder, and hyperemia of the vesical triangle. Olshausen considers it a neurosis due to a pre-existing catarrh. The history of the cases I have seen do not bear out this idea. Kelly thinks the trouble due to a hyperemia located at the vesical triangle, and recommends as a sure cure the use of a three per cent solution of silver nitrate painted directly on the abovementioned surface with the aid of the cystoscope.

I believe the trouble is originally and essentially a neurosis (whatever that may be) located at the vesical sphincter, and the parts involved may become hyperemic. We see other orificial muscles, notably those of the vagina and rectum, similarly affected.

For treatment Kelly's method, as well as others mentioned in the text books, are worthy of trial in the simpler cases. Success has been achieved in some hands by dilatation of the urethra and by cocaine injections, while others regard both

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as useless. Electricity, with massage and change of climate, have their appropriate places as remedial agents. Other methods have been successfully employed, but we meet with severe cases whose obstinacy is a test to the strength of the patient, the endurance of the attendants, and the skill of the doctor. It is here the operation mentioned is of such signal benefit, and its rationale explained in the fact that the urine in finding its new channel gives the sphincter vesicæ a complete rest. With this accomplished the bladder reflex is abolished and the high nervous tension of the whole body relieved.

In my opinion there is a wider field for this method of treatment, and its more frequent adoption would result in the cure of many cases otherwise destined to become physical as well as mental wrecks.

MALIGNANT TUMORS OF THE BREAST.[1]

BY

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IN our zeal for searching out points of difference between tumors and for giving to each variety some descriptive and distinguishing name, we are, I think, in danger of overlooking some of the more important features common to all. A comparative study of neoplasms is very instructive and teaches us that many of our classes and varieties are given improper and more or less misleading names. There is no doubt in my mind that a tumor may pass from one variety to another, or even from the broad class of benign to that of malignant growths. And while, for convenience' sake, it is well to have some such classification as we have, and while, for clinical purposes, it is important that we know the usual clinical history of each variety, we should not lose sight of the fact that some of our distinguishing features are but temporary conditions of a transitional period in the tumor's growth, and that others are accidents due to anatomical peculiarities of the tissue from which the tumor springs and have therefore no bearing upon its morphological significance.

[1] Read before the Washington Obstetrical and Gynecological Society, May 19, 1899.

An excellent concrete illustration may be found in the ordinary adenoma of the mammary gland, which differs from normal breast tissue only in having a greater amount of connective tissue interposed between the gland tubules and in more or less irregularity in the size and shape of these tubules. Ranvier, Virchow, and others have pointed out the fact that adenomata are really growths of connective tissue into the tubular interspaces, and should be called and regarded as fibromata in which the enclosed glandular elements are accidental phenomena.

Such a tumor is usually a true fibroma.   But if the infiltrating connective tissue be rapidly forming and rich in cells that have not had time to throw out fibrillary processes and become mature connective tissue, the growth would be properly classified as sarcoma. We cannot draw a sharp line between fibroma and sarcoma, either clinically or with the microscope, nor can we always distinguish sarcoma from simple inflammatory infiltration.

The chief element of adenoma, adenofibroma, adenosarcoma, and myxoma is an infiltration of connective tissue more or less rich in cells or mucilaginous material.   Let any tissue become infiltrated with leucocytes and proliferating connective-tissue cells, as it invariably will under the influence of prolonged local irritation, and we have the ancestor for such a tumor.   Let these infiltrating cells change into connective-tissue cells, as they invariably will if the irritation be sufficiently prolonged, and we have a tumor that will be fibrous or sarcomatous according to the slowness or rapidity of the process. We have only to find and understand the source of irritation to complete the etiology.

We would imagine, from the reading of our text books, that the diagnosis of tumors by the microscope was an easy matter.   Indeed, most physicians entertain that opinion.   I will venture to assert, however, that I can easily produce a piece of simple inflammatory tissue from an acute inflammation that cannot be diagnosed microscopically from small round-celled sarcoma, and another piece from a chronic inflammation that cannot be diagnosed from fibroma by any microscopist.   Indeed, a scar is identical in structure with some fibromata, and is in reality a sort of physiological fibroid tumor, and not infrequently becomes excessive and forms the well-known pathological fibroid growth known as keloid.

All inflammations that result in destruction of tissue or sup-

puration leave behind them a certain amount of fibrous infil-
tration which, if it be located in glandular tissue or mucous
membrane, will enclose gland tubules and be indistinguishable
from adenoma. I have in my possession a section from the
breast of a woman who died of nephritis soon after the healing
of a mammary abscess, which cannot be distinguished from
ordinary adenoma.

During the past two years I have been much puzzled in
making the differential diagnosis between sarcoma and tuber-
cular infiltration. I have had a large number of cases to treat
in which the diagnosis lay between these two diseases, and I
have sought help from the microscopists. I have sent sections
of such tumors, not to one, but to two or three of the best micro-
scopists and pathologists available, and have usually received
a reply that the tumor was either sarcoma, tubercular, or syphi-
litic, with a leaning to one or the other, but seldom a positive
statement of opinion. One tumor, sent to three different micro-
scopists, was diagnosed by one simple inflammatory tissue, by
another as probably syphilitic, while the third was in doubt as
to whether it was tubercular or sarcomatous. I am myself
still in doubt as to whether it is a tubercular infiltration or a
sarcoma.

I mention these facts, not in criticism of the microscopist
or pathologist, but simply to show the similarity, or I might
say identity, of inflammatory infiltration and some tumors of
mesoblastic origin, at least as far as anatomical structure and
clinical appearances go.

Carcinoma, fortunately, is easily identified; but there is not
only this identity of structure between inflammatory tissue
and some sarcomata, but there is much evidence to show that
benign as well as malignant tumors frequently occur in some
tissue that has been the seat of inflammatory infiltration. The
chief anatomical features of sarcoma are connective-tissue
hyperplasia, hyperemia, with some infiltration of leucocytes.
The chief anatomical features of inflammatory tissue are con-
nective-tissue hyperplasia, hyperemia, and infiltration of leuco-
cytes. In sarcoma of rapid growth and in acute inflammation
the proliferating connective-tissue cells are of the embryonic or
undifferentiated type, simply because they have not had time
to become differentiated into mature connective-tissue cells.
In slow-growing sarcomata and in chronic inflammations
these cells are more like connective-tissue cells, because they
have had more time to develop. If the process in sarcoma is

sufficiently slow the cells will become mature connective tissue, and *the sarcoma will not be a sarcoma* but a fibroma.   Indeed, I am tempted to say that small round-celled sarcomata and fibromata are both *forms of inflammatory hyperplasia*, the one acute and the other chronic, with many intermediate forms or stages depending upon the rapidity of the process. Giant cells, when they occur, are accidental phenomena due to fusion or overgrowth of infiltrating leucocytes, and in no wise differing from those of tubercular origin.

We have only to find the cause of the inflammation or source of irritation to complete the etiology.   It may be a germ, it may be a trophic nervous lesion, it may be a lesion of the blood vessels, or it may be some continued external irritant.   A very plausible theory to me is that a simple inflammatory infiltration pressing upon and destroying the nerves to some group of cells that are already irritated and proliferating, may leave them free from all inhibitory influence and consequently free to proliferate indefinitely, unless checked by the activity of other cells that have not lost their nerve connections.   A certain amount of predisposition is necessary, otherwise the healthy body cells will wall up the whole mass in a capsule and render it innocuous.   But if the body cells are inactive the tumor cells continue to grow, and finally some of them escape through the lymphatics or blood vessels to start secondary growths in distant parts.

In the case of epithelioma and carcinoma we must introduce a new element—the proliferating epithelial cell.   Such tumors invariably spring from tissue containing epithelial cells, usually those lining glandular tubules.   Let some of these epithelial cells become separated by inflammatory infiltration from all nervous influence, and what would we expect to happen?   As I pointed out in a paper on " Mammary Neoplasms " in the *Medical News* of January 11, 1896, they are embryonic cells, and now independent organisms resembling amebæ.   They are in a rich and suitable culture medium.   They are free to multiply and wander into surrounding tissues indefinitely, unless checked by the action of normal body cells.   The microscope shows us plainly and unmistakably that under some abnormal condition or influence these epithelial cells do attempt to wander into surrounding tissues ; that an attempt is made by the connective-tissue cells to wall them up by forming a capsule around them; that many of them are walled up in the alveoli, but that a few are continually escaping

before the capsule is completed around them and starting new foci of infection; that where the connective-tissue cells are comparatively active, thick walls are formed around the alveoli, the alveoli are small, few cells escape, and the tumor grows slowly. On the other hand, where the connective-tissue cells are less active we have large alveoli with thin walls, rapid escape of epithelial cells, and rapid growth. The lymph spaces and lymphatics are finally invaded and secondary foci established. The tumor consists of the proliferating epithelial cell and the proliferating connective-tissue cell that is endeavoring to check the invasion. In some cases the invaders may be few and the body cells may encapsulate them and squeeze them out of existence, leaving no tangible trace. How many incipient cancers are choked out of existence in this way it is impossible at present to say. It seems probable, however, that in perfectly normal individuals this phenomenon may be of very frequent occurrence. The behavior of skin grafts seems to show this. We have in skin graft epithelial cells severed from all nerve connection, and it is interesting to note that they act very much as cancer cells do and without the aid of any bacterial infection. On suitable soil it is quite possible that a skin graft might start a cancer.

Dr. Ludvig Hektoen, in the first volume and number of *Progressive Medicine*, has collated some striking observations on the growth of epithelial cells. Ljunggren, he says, found to his surprise that he could preserve carefully sterilized bits of human skin in sterile human ascitic fluid for months and that the cells of the tissue retained their vitality. Successful transplantation was made with pieces kept in such sterile fluid for a month. The transplanted cells not only grew over the raw surface, but penetrated into the granulation tissue beneath, after the manner of a beginning carcinomatous growth.

The abstract of Loeb's observations on epithelial regeneration by Dr. Hektoen is so clear that I copy part of it verbatim:

"From the margin of a tissue defect huge epithelial protoplasmic or plasmoidal masses move in a sliding manner over the naked surface, enclosing and dissolving the crusts and other obstacles. Regenerating epithelium readily removes such substances as cartilage when placed in its way. Below the protoplasmic layer epithelial cells wander in from the margins of the defect and often grow down into the connective tissue, apparently checking the growth of the latter. The process is closely allied to changes in carcinoma. At the same

time active changes, such as mitoses, occur in the epithelial cells removed some distance from the margins of the wound."

According to Loeb small pieces of epithelium placed in the centre of scabs or crusts send out processes in all directions into the crust, the cells acting as separate organisms independent of blood supply or nervous influence.

Many observers have demonstrated the fact that epithelial cells may retain their vitality for an indefinite period. It is said that skin grafts may be simply dried and kept for months between the leaves of a book, and that they will then grow. I have seen a graft, separated from the tissues by blood clot or by a collection of serum, grow without difficulty upon the removal of the clot or serum, even though it had been separated in this way for three or four days; and I have moved a displaced skin graft back into position ten days after it was placed and had it grow.

There seems to be no question that cancer is caused by proliferating epithelial cells, cells that have taken on a rapid and wild growth, and that the bulk of the growth is made up of these cells and connective-tissue hyperplasia due to the irritation of these foreign bodies. It is an effort of the organism to rid itself of an invader, a reaction to irritation. It comes very near being in the strictest sense a local inflammation.

The vital question is: What causes the epithelial cell to proliferate and invade? There are several possible causes, but only two have been offered that meet all the conditions and explain all the known phenomena. One is that these cells are intoxicated by a bacterial product—the germ theory; the other is my theory of severance from central nerve influence. (The inherited cancer cell is too far-fetched.) One or both of these causes may exist singly or together, and all known theories or explanations require a certain hereditary or acquired predisposition. This predisposition, I believe, is a lack of vigor and activity of the body cells, and may be inherited, or may be acquired by faulty nutrition and assimilation of food, by nervous worry and exhaustion, and perhaps in other ways. It may be general or local, and apparently depends upon weak or faulty nerve influence over the body cells, preventing them from checking epithelial invasion. It may be due to faulty nutrition or autointoxication of the body cells themselves; but as many cancer patients are well nourished or even robust in appearance, it would seem to be more often due to a change of the central nerve cells such as is found in old age, or

to some local peripheral nerve lesion. In the aged the nuclei of nerve cells become shrivelled and atrophied, no matter how healthy the individual, and no doubt produce less nerve force. This may be the main reason why cancer is more common in advanced life.

Billings has shown that carcinoma is increasing in frequency in proportion to the increase in high civilization. Williams has shown that in England and Wales cancer in the last fifty years has increased out of proportion to any other disease. In 1840 there were, according to his estimate, 4,500 cases, and in 1895, 40,000. There are now, according to this high authority, 10,000 cancers of the *breast* in England and Wales. The causes of this increase are given by both Williams and Billings as worry and bad health incident to modern civilized life, particularly city life. It must be borne in mind that since sanitary medicine has stopped the fearful ravages of such diseases as small-pox, cholera, and plague, deaths from all chronic and incurable diseases, such as apoplexy, Bright's disease, and cancer, have become, as a matter of course, relatively more frequent. There seems, however, to be a consensus of opinion that cancer is increasing out of proportion to other diseases, and it is certainly much more common among civilized than among savage or barbarous peoples.

But, besides this inherited or acquired predisposition, I believe there is necessary some long-continued local irritation. This seems to hold good no matter whether the exciting cause is to be a germ or merely the severance of nerve connection to the epithelial cells, for both causes must be common and frequently inactive.

This irritation need not be in the form of external violence, though bruises seem often to be the immediate exciting cause. It may be, in the case of the breast, a reflex or sympathetic irritation due to uterine disease. Indeed, it seems pretty well established that a chronic interstitial mastitis (chronic mammary tumor of Astley Cooper) is caused by irregularities of menstruation or uterine disease as well as by trauma, and that it not infrequently becomes the seat of cancer.

Dennis, in his "System of Surgery," says: "This growth often forms the nucleus of carcinoma." And in speaking of adenoma he says: "The treatment is excision, since the tumor is likely to grow rapidly in response to some exciting cause, such as traumatism, pregnancy, or lactation. Removal is therefore advised, because the growth will not disappear

spontaneously, but may degenerate into a tumor of malignant type."

Mr. Roger Williams and other recent writers have minimized the influence of trauma and of pre-existing inflammatory lesions as causes of cancer, but admit them as occasional causes. Williams says "intrinsic causes are much more important factors in the origination of cancer than extrinsic ones," and that "the occasional transformation of innocent into malignant growths must be admitted." But he does not think such growths specially prone to malignant degeneration. He apparently refuses to credit the statement, almost invariably made by cancer patients, that the cancer was preceded by some traumatic or inflammatory condition, or by uterine disease, while other statements are received without question.

I began my medical career with the same prejudice. I knew there was a widespread belief, both in the profession and among the laity, that bruises were a cause of cancer; but I did not believe it, and was annoyed by the persistence of patients in giving the history of a bruise or an abscess, then a knot or lump, then perhaps a period of quiescence, then a rapidly developing tumor.

A case came under my observation of a bruise followed by an abscess. The abscess was evacuated, but a brawny infiltration remained for some time. A year later this had disappeared, but a mass of scar tissue could be felt deep in the gland at the seat of abscess. At the end of two years this tumor became painful and began to grow rapidly. This tumor was removed in 1891 and reported in the *Virginia Medical Monthly* for December, 1891. Upon microscopical examination by Dr. J. Foster Scott at Columbia Hospital it was found to be an ordinary adenoma, but, much to our surprise, there was in the centre of it a typical nodule of scirrhous carcinoma. The patient is still under observation and has had no recurrence. She married a year after the operation and has now a well-grown, healthy boy nearly 6 years old. The accompanying microphotograph of an adenocarcinoma kindly given me by Dr. Gray, of the Army Medical Museum, shows, I think, very plainly a beginning malignant change in an ordinary adenoma of the breast. Four cases have come under my own observation in which mammary abscess has been followed by the development of a tumor, in one case into a rapidly fatal round-celled sarcoma, in one into carcinoma, and in two into adenomata of large size.

I also present for your inspection a most interesting osteo-sarcoma of the os calcis, which has the following history: Ten years ago a thorn pierced the heel deeply. This was followed by soreness and swelling which never completely subsided. A hard knot formed and was quite painful at times. Of late it grew rapidly and caused great pain and lameness. April 29 I amputated the foot at the Emergency Hospital, and had sections of the growth made by Dr. Wallace Johnston, who pronounced it osteosarcoma.

ʄ Microphotograph of adenocarcinoma, showing a breaking-down of the walls of the gland tubules and invasion of the connective tissue by epithelial cells.

There are many facts that go to show that tumors usually, if not always, develop in tissue that has been the seat of some inflammatory infiltration. This does not necessarily mean violence or serious trauma, but may be due to slight, long-continued irritation, mechanical, chemical, or reflex. I believe myself that cancer never begins in healthy tissue. There are many facts to support this belief. Chimney-sweeps' cancer, smokers' cancer, tar cancer, paraffin cancer, lupus cancer of Richter, Hutchinson's arsenic cancer, and multiple cancer of

the tongue following psoriasis of the tongue, are all preceded by inflammatory lesions. Smokers' cancer is preceded, often for years, by smokers' patch or leucoplakia. Glass-blowers' patch, or chronic epithelial stomatitis, is a similar affection, frequently followed by nodule, ulcer, fissure, and cancer. Sharp, jagged, and decayed teeth and badly fitting false teeth have been assigned as causes of cancer of tongue or gum in many recent cases. Moles and warts have long been known to be the starting point for malignant growths under some traumatic stimulation. I have operated upon four cases of epithelioma of the lip within the past year, in all of which there were decayed teeth and Rigg's disease present, and one case of sublingual cancer that apparently had its origin in a carious and suppurating root.

Organs are attacked in proportion to their exposure or irritation. Next to the uterus the breast is the most common seat of cancer, and next to the uterus the breast is the organ most exposed to traumatism and reflex irritation.

To-day at the Emergency Hospital I operated upon a lady, about 18 years old, for a tumor situated in the subclavian triangle in Mohrenheim's fossa. It proved to be a cyst about the size of a hen's egg, with very thin walls, and near it I found several other cysts the size of peas. I then noticed a scar under the chin. It was evidently an old white scar. Running my finger over it, I felt a tumor under it, made an incision, and removed a solid, encapsulated tumor, nearly round, and about three-quarters of an inch in diameter. I have not yet had a microscopic report, but it looked like adenosarcoma. Here was a tumor developed under a traumatic lesion, and the inference is strong that it was caused by traumatism.

Mr. Jackson Clark [1] believes that in certain cysts of the breast there is reached an intermediary stage in which an adenoma may grow in response to a certain stimulus, or, if there is a predisposition to carcinoma and the patient over 45, a pure carcinoma may develop. Dennis says this is a most important observation, since it serves to explain in glandular cysts the development of adenoma in one case and of cancer in another.

Statistics show that 80 per cent of all tumors of the breast are carcinomatous and 2 or 3 per cent sarcomatous. But these statistics are taken from diagnoses made late in the course of the disease. There is no way of knowing just how many of

[1] Dennis' "System of Surgery."

these tumors were benign in the beginning. We know that some are, and it seems quite probable that in all or nearly all cases there is at least a brief period in the development of carcinomata when they have neither the clinical nor microscopical appearances of malignancy nor the tendency to return after removal. New cases are constantly being reported where tumors are caught in a transitional stage from benign to malignant.

In the *Journal of the American Medical Association* for May 6, 1899, Dr. Warthin, of Ann Arbor, Mich., reports two cases of multiple carcinoma. There were four primary growths in the two cases, one of which was in the gall bladder, which also gave evidence of chronic inflammation and contained gall stones. After calling attention to the fact that gall stones are found in nine-tenths of all cases of gall-bladder cancer, he says: " The circumstantial evidence is very strong that the hyperplasia of the gall-bladder mucosa may be the starting point of a carcinomatous proliferation; that the hyperplasia may pass through the stage of adenoma to that of carcinoma. . . . Case 2 undoubtedly shows this change. . . . The second tumor of Case 1 represents a fairly common group of neoplasms, a teratoma of the ovary, becoming carcinomatous through proliferation of its epithelial cells. . . . It is interesting to note that in this case the carcinomatous proliferation arises in the adenomatous portion of the teratoma, and that there is a well-marked succession of stages through adenoma simplex, adenoma papilliferum, and adenocarcinoma to carcinoma medullare. . . . The second tumor in Case 2 is also an example of adenoma becoming malignant."

In conclusion Warthin says: " Our present state of knowledge concerning the etiology of multiple primary carcinomata might then be expressed as a theory of multiple seats of a cell anomaly, consisting in the removal of the normal inhibition of the cell leading to atypic overgrowth, and that in the production of this cell anomaly parasitic, physical, or chemical irritants may play the rôle of a primary exciting factor." Dr. Warthin has independently gotten very near my explanation of cancer printed in the *Medical News* of January 11, 1896, when he speaks of " removal of the normal inhibition of the cell leading to atypic overgrowth."

I have spent so much time upon these interesting theories that I must be brief on practical points. I cannot close this

paper, however, without emphasizing to the very best of my ability one or two practical conclusions.

First, that it is absolutely impossible, in a very large number of cases of cancer of the breast, to make the diagnosis in the very early stages of the disease before operating.

Secondly, that this is the time to operate, for if we wait for diagnostic or even suspicious symptoms of malignancy we greatly lessen our chances for a cure.

Thirdly, we should urgently advise the removal at once of every tumor of the breast, no matter how small or innocent it may appear, and invariably have it examined microscopically by a competent microscopist.

The elder Gross remarked, shortly before his death, that he did not believe he had ever cured a cancer ; that he only operated as a palliative measure and for moral effect.   If Dr. Gross had been in the habit of having examined microscopically all the supposedly benign growths that he removed, he would never have made that remark.   He would have found, as I have found, that many of the supposedly benign growths are malignant.

Removed before there are any signs of malignancy, they do not recur; nor is it even necessary to remove the whole breast in many cases.   Removed after suspicious symptoms have appeared, 50 per cent of recoveries may be expected, provided a radical operation be done.   Removed after palpable enlargement of the axillary glands, there are few, if any, permanent cures, even with the radical operation, though with the complete operation of to-day a small percentage will be really cured.

Dennis[1] says: '' After a thorough search into the literature of the subject to ascertain to what extent the duration of the disease before operation influenced the question of recurrence, statistics furnish no accurate data upon this point.

'' In a study of my own cases bearing upon this subject it was found that in all the cases in which a permanent cure for three years or more was accomplished, the tumors were removed on an average of six months from the date of their first recognition in the breast.

'' It is also an interesting fact that in many of the cases of permanent cure the axillary glands were not indurated, or at least there was no outward evidence of an invasion.''

[1] '' System of Surgery,'' vol. iv., p. 912.

Nothing will so diminish the death rate from cancer of the breast as the early and complete removal of all growths in this gland, and it is our duty to spread this doctrine among the laity. Never mind the diagnosis—make that after operation. When there are absolutely no signs of malignancy it is suffi- cient to remove the tumor in its capsule, or, if none be present, in a capsule of healthy tissue a half-inch thick. The tumor should be at once examined by the naked eye, and if it appear malignant the whole breast should be removed. It should also be examined by a competent microscopist with as little loss of time as possible, and if found malignant the whole breast should be removed.

In 1890 to 1892 I operated in this way upon 4 cases supposed before operation to be benign. Examination of the tumors immediately after removal showed them to have a malignant naked-eye appearance, and in each case the whole breast was removed. They all proved under the microscope to be carci- noma. Since 1892 I have operated in a similar way upon 7 cases, all subsequently proved to be carcinoma. All of these 11 cases have passed the three-year limit without any recur- rence, and 4 of them are well at the end of seven or eight years.

None of my very early cases have recurred—I mean cases where there were no signs of malignancy and where the diag- nosis was made only after removal, although in none of these cases was the axilla opened, and in 2 the tumors were excised without removal of the whole breast. I would, however, even in these early cases, advise removal of the whole gland.

When any signs of malignancy, such as glandular enlarge- ment, fixation, retraction of the nipple, involvement of the skin, rapid and painful growth, are present, a complete opera- tion should be done. No exact rule can be laid down that will cover all cases, but nothing short of removal of the axillary glands and fat, the pectoralis major muscles, and the subcla- vicular glands, together with the whole breast and skin of the breast, should be considered sufficient.

A common mistake is made in removing too little skin and in leaving parts of the pectoral fascia. Stiles has demonstrated true gland tissue extending from the breast into the suspen- sory ligaments of Cooper as they extend into the corium, and Heidenhain has shown that the fibrous capsule of the breast is thin and incomplete on the surface next the pectoral fascia. Halsted has demonstrated cancerous infection of the pectoral

fascia and muscles where there was no appearance of such in-
fection to the naked eye.

In carefully examining the axillary fat and subclavicular
tissue, I have several times found infected glands where they
were not felt before operation, nor even discovered during
removal. It should be borne in mind that all enlarged glands
near a cancer are not necessarily infected with cancerous ma-
terial. It may be some other accidental infection. This may
explain freedom from recurrence in some cases where the
glands were supposed to be infected, and where less complete
operations were done than would now satisfy us.

Several years ago I recommended beginning the operation in
the axilla to prevent forcing cancerous material into the deeper
tissues while manipulating the breast. Dennis recommends
the use of another clean knife in the axilla, if the breast is
removed first, to prevent infection of the axilla.

I believe it not only safer to begin with the axilla, but that
much time will be saved by exposing the axillary vessels and
ligating branches going into the tissue to be removed, before
removal of the tumor. The long thoracic and acromio-thoracic
arteries furnish the main blood supply to the outer and lower
part of the breast, and if these be first ligated near their origin
that part of the dissection will be comparatively bloodless. I
now operate as follows : Begin an incision over the axillary
artery just internal to the biceps and coraco-brachialis muscles
on the arm, and carry it down around the tumor and back to
the starting point, cutting through the skin. This is rapidly
but carefully done, so as to include all the skin it is deemed
necessary to remove. Bleeding is checked and then the axillary
vessels exposed by careful dissection, the attachment of the
pectoralis major divided and held out of the way, all branches
of the axillary vessels going to the axillary fat and chest
ligated, and the axilla carefully cleaned, the anterior wall first
up to the apex, and then the posterior wall well down under the
latissimus dorsi. This is done without tearing or mangling
the axillary fat, by clean cutting aided by slight traction or
peeling with the fingers or a blunt dissector. The skin flaps
are then dissected back as far as necessary, the clavicular and
costal attachments of the pectoralis muscle divided, the sub-
clavicular areolar tissue and glands removed, and then the
muscle, breast, and tumor. Raising up the pectoral muscle in
this way from above also saves time and bleeding, as it allows
most of the vessels to be seen and clamped before cutting.

No operation should be attempted unless there is reason to believe that all the cancerous tissue can be removed. If any portion of the growth be left, it will grow with great rapidity after operation. I have found it worse than useless to attempt any operation when the tumor is firmly fixed to the chest wall. I have recently tried operation on three such cases to see what could be done, and the results were very unsatisfactory. Portions of the growth were of necessity left, penetrating the intercostal spaces, and in a few weeks the condition was worse than before operation, though there was some relief from pain. I think it better in such cases to relieve pain with morphine. I have tried formalin solution as a dressing on ulcerating cancer of the breast, but found it painful and useless. Any tumor that can be completely removed by formalin or any caustic can be just as completely removed by the knife; and the knife is far preferable, as it saves both time and pain. Inoperable cases are best treated by Coley's method, or simply palliative measures, such as tonics, and morphine to relieve pain when severe. In painful cases morphine should be given regularly and systematically to get good results. Commence with one-thirty-second or one-twenty-fourth grain doses every two hours and gradually increase. Given in this way there will be little or no nausea or constipation.

Since writing the above, Dr. Carroll, of the Army Medical Museum, has given me a beautiful section of tumor of the uterus, showing a gradual gradation from adenoma to adeno-carcinoma and carcinoma. He does not consider this a rare occurrence.

PAROTID-GLAND THERAPY IN OVARIAN DISEASE.[1]

BY

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I DESIRE this evening to report a few cases of ovarian congestion and chronic oöphoritis treated by means of desiccated parotid gland of the sheep. I have had this agent prepared in tablet form, so that each tablet contains two grains of the

[1] Read before the Section on Gynecology, College of Physicians of Philadelphia, May 18, 1899.

desiccated powder, which is equivalent to twenty grains of the fresh gland. The dose is from three to six tablets daily, the average dose being four tablets a day.

We know that some obscure relationship exists between the parotid gland and the ovaries and testicles. This is shown clearly in mumps, and we are now reading reports of parotiditis following certain abdominal operations.[1]   Dr. Robert Bell, of Glasgow, was the first to call the attention of the profession to the value of this agent in certain diseases of the ovaries, and at the meeting of the British Gynecological Society in June, 1896, he reported a number of cases in which he had obtained very gratifying results.[2]   I began the use of desiccated powder of parotid gland in November, 1897, and have already reported a number of cases.[3]

At a recent meeting of the alumni of the Charity Hospital of New York, Dr. E. Pierre Mallett reported twenty cases of ovarian disease treated by means of parotid-gland extract.[4]   The results were very remarkable and gratifying. Almost immediate relief from pain followed the treatment, and enlarged, tender, and apparently adherent ovaries, at the end of a few weeks' treatment, became reduced in size and could be palpated without pain.

The class of cases which I have selected for this treatment is limited to those which we speak of as cases of ovarian congestion and cases of chronic oöphoritis unassociated with extensive pelvic inflammatory disease; cases where the tubes are not extensively involved and where there exists very little if any exudate. In these cases the enlarged, tender, prolapsed, and sometimes adherent ovaries can be readily outlined, especially when the examination is made under an anesthetic. These women suffer constant discomfort and severe pain, becoming aggravated a few days before the menstrual period, which is often irregular and may be free or scanty. There is often some relief from pain with the flow, but more frequently the dysmenorrhea is severe. The pain is situated in one or both

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[1] Skene Keith: Edinb. Obstet. Soc., xi., 119, 1884.   A. Duval Atkinson: Johns Hopkins Hosp. Bull., No. 79, Oct., 1897.   Stephen Paget: Brit. Med. Jour., 1897.   N. T. Brewis: Edinb. Obstet. Soc., xviii., 275.

[2] The Lancet, vol. i., 1896, p. 1496.

[3] AMERICAN JOURNAL OF OBSTETRICS, vol. xxxviii., 1898, No. 3; Med. News, Aug. 27, 1898; AMERICAN JOURNAL OF OBSTETRICS, vol. xxxix., 1899, No. 2.

[4] Am. Gyn. Jour., vol. xv., p. 12.

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iliac fossæ and radiates to the bladder, rectum, sacrum, hip, and down the affected side. The cases which I report to-night have all suffered with these painful symptoms for many months or years, and have been unable to obtain relief by other forms of treatment. The results show that parotid-gland feeding relieves ovarian pain and causes reduction in the size and ten- derness of enlarged and sensitive ovaries; also that under the influence of this agent the menses become regular and less painful.

CASE I. (page 206).—A. D., single, age 19, married two years, sterile. Pain in small of back and in left iliac fossa for four months, worse during menstrual periods, which are irregular, usually late, and scanty. Examination shows an enlarged, prolapsed, and very tender left ovary. Started parotid-gland treatment December 11, 1897. One week later she reported that the pain had entirely disappeared. On December 21 the ovary was reduced one-third in size and could be palpated without pain. On March 26 the ovary was of normal size and in good position. Menses usually a few days late. She complains of no pain at any time.

CASE II. (page 297).—C. E., single, age 22. Menses regular, five to seven days, free. Severe pain in both ovarian regions for two days before flow. Constant pain during interval on both sides and in small of back. These symptoms persisted for two years. Upon examination was found an enlarged, prolapsed, very sensitive right ovary. Left ovary in good position, en- larged and very tender. Treatment by parotid gland for three weeks. Pain relieved after second day. No pain after first week. Menses appeared in third week on time and was unat- tended by pain. Upon examination both ovaries were found normal, in good position, and could be palpated without pain.

CASE III. (page 314).—L. C., age 25, married three years, sterile. Menses irregular, five days; scanty first and second days, then free. Severe pain on right side the day before and during menstruation; constant discomfort on right side during interval. Coition painful. Examination: Resistance and ten- derness in both lateral vaginal fornices; right ovary prolapsed, enlarged, and very tender; uterus tilted to right side, not freely movable. She was under treatment for four weeks, during which time the discomfort subsided, and menstruation came on in fourth week and was attended by only slight pain for one hour on the first day. The ovary had diminished in size and was no longer tender to the touch.

CASE IV. (page 316).—L. McN., age 28, married four months. Menses regular, last only one or two days; severe pain during and for two or three days after. Frequent pain in both iliac fossæ during interval for past year. The uterus was retroverted in second degree; both ovaries prolapsed and very tender. She was under treatment by parotid gland for nine weeks. The first period appeared in third week, lasted two days, and was less painful than at any time during the previous eighteen months. The next menses appeared on time, lasted two days, and she experienced no pain. Upon examination both ovaries could be palpated without pain; uterus was retroverted in second degree, and both ovaries prolapsed.

CASE V. (page 466).—M. D., age 24, married two years; two miscarriages, the last one year ago. During the past year constant right and left ovarian pain; menses regular, three days; severe pain the day before and during. Examination: Bilateral laceration of cervix with erosion. Uterus enlarged and posterior pelvis very tender; fulness on both sides, with tenderness most severe on right side. Almost immediate relief from pain followed treatment by parotid gland, which was continued for eight weeks. The next menses lasted three days, without pain except for a few hours on the second day. The pelvis was less tender on examination. Otherwise the same. Advised repair of lacerations.

CASE VI. (page 469).—W. A., age 23, married six years, IIpara. Menses regular, five days. Pain in both ovarian regions, most marked on right side, the day before and during flow; amount free. Examination shows lacerated cervix, fundus anterior, an enlarged, very tender right ovary. Complains of constant pain and discomfort on right side during past two years. Under treatment the pain on right side disappeared in a few days. She continued treatment four months. Menstruation is regular and normal, unattended by pain. She said she felt perfectly well, and declined operation for lacerated cervix.

CASE VII. (page 474).—J. L., age 29, married one year, sterile. Complains of constant lumbo-sacral and right ovarian pain, no worse during menstrual period, which lasts only one day and is very scanty. Examination shows a small uterus in normal position, right ovary prolapsed, slightly enlarged, and very tender. At the end of one month after beginning treatment she returned, saying that she had experienced no pain for three weeks. Her next period lasted three days. There was

sharp pain for a few hours during the day before and first day. The ovary could be palpated without pain.

CASE VIII. (page 28, volume ii.).—J. T., age 25, Ipara. Menses regular, five days, free, no pain during flow. Complains of constant, severe right and left ovarian pain during interval, becoming aggravated during the three days before the flow. Examination showed both ovaries enlarged, prolapsed, and exquisitely tender. After three weeks' treatment with parotid gland she reported that the pain in her sides had entirely disappeared. She menstruated in the third week and experienced only slight pain in the right side for a few hours the day before. Palpation of both ovaries causes only slight pain.

CASE IX. (page 30, volume ii.).—A. R., age 24, single. Complains of left ovarian pain, constant for eight months, worse the day before menses appear, only slight pain during. The uterus was movable, but tilted toward the left side. Right adnexa normal; left ovary enlarged, very tender, and slightly prolapsed. After three weeks' treatment she reported that the pain had disappeared on the third day. There was still some soreness in the left side. She menstruated in the third week and had no pain the day before. The ovary was less tender to touch.

MUMPS COMPLICATED WITH ORCHITIS AND NEPHRITIS.[1]

BY

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IDIOPATHIC parotitis, or mumps, is generally regarded as a disease of minor importance and not worthy of much attention on the part of the physician. Many of the text books, while pointing out some of the complications which may occur, do not lay any stress upon the necessity of keeping the patient quiet or guarding him against the complications which sometimes endanger his life. The case that I shall report illustrates the dangers to which some of these patients are exposed. Such grave complications are, fortunately, rare in early life, but it is

[1] Read before the Washington Obstetrical and Gynecological Society, March 17, 1899.

always well to keep before us the fact that they may occur and to impress upon the layman the importance of the disease.

Charles C., male, colored, 9 years of age, entered my service at the Children's Hospital November 2, 1898.

Family History.—Good.

Previous History.—Labor normal. Was breast-fed for twenty-four months; after that, was given general diet. He had an attack of pertussis, but made good recovery. Was well from that time until his sixth year, when he had an attack of the measles which was of a very mild character. Since then he has been well until the present attack.

He was taken sick about a month ago with a small swelling situated at the angle of the left inferior maxilla. This gradually extended into the region of the parotid gland, and he complained of pain and stiffness on attempting to open his mouth. These symptoms continued for two days, when the pain and swelling suddenly disappeared, leaving only a slight stiffness and swelling in the jaw. His left testicle became very painful and was much swollen. This condition persisted for about ten days, when the pain and swelling gradually disappeared. Shortly after this he began to have a slight cough and complained of shortness of breath, especially after having made any exertion. After a few days it was noticed that in the mornings a slight edema of the lower eyelids existed, but this would gradually disappear during the day. The feet became swollen; then the legs and abdomen, which became greatly distended. Four days ago the edema of the feet and legs disappeared, leaving only the abdomen swollen. His appetite has been good and he has been having regular diet. The bowels are constipated. He passes a small amount of high-colored urine.

Present Condition.—The boy is fairly well nourished and lies quietly in bed, generally in dorsal decubitus.

Respiratory System.—There are movements of the alæ nasi with each act of respiration. Respirations rapid and markedly abdominal in character. On percussion there is slight dulness over lower lobes of both lungs. On auscultation there is broncho-vesicular breathing in the upper lobes of both lungs, with diminished breathing in the lower lobes.

Circulatory System.—Apex beat is in normal position, but diffused. All the heart sounds are accentuated.

Digestive System.—Tongue coated in the middle, but red on edges and tip. The papillæ are enlarged and show through the

white coating of tongue. Appetite good. The bowels are constipated, and he does not have a stool without taking a laxative. Abdomen enlarged and distended. There is some fluid in the peritoneal cavity. The spleen is normal in size. The liver is slightly enlarged and can be palpated below the free edge of the ribs.

Integumentary System.—The skin is dry and harsh. It pits on pressure all over the body.

Nervous and Osseous Systems.—Negative.

Glandular System.—Slight enlargement of the parotid on the left side.

The patient was kept in bed and ordered milk diet. A teaspoonful of liquor ferri et ammonii acetatis was given every three hours ; the bowels to be kept open with Rochelle salts.

November 3: Slept well and took nourishment well. Twenty-six ounces of urine passed in twenty-four hours; color, deep amber, with flocculent sediment; specific gravity, 1020; reaction, acid; urea, 11½ grains to the ounce; albumin, large quantities. Microscopical examination: Blood corpuscles and blood casts, with a great many epithelial cells and epithelial casts.

November 5: Boy has been sleeping well and taking nourishment well. Urine for the past twenty-four hours: quantity, 32½ ounces; specific gravity, 1000; color, light amber; albumin, none; reaction, alkaline; urea, 2 grains to the ounce. Microscopical examination: Some epithelial cells with epithelial casts, and one or two blood cells.

November 7: The boy appears much brighter. He has passed 36 ounces of urine in the past twenty-four hours.

November 9: The edema has disappeared. Urine for past twenty-four hours: quantity, 38 ounces; specific gravity, 1011; reaction, acid; urea, 4 grains to the ounce; albumin, none. Microscopical examination: Few epithelial casts, many epithelial cells.

November 12: Urine for past twenty-four hours: quantity, 32 ounces; specific gravity, 1011; reaction, acid; urea, 5½ grains to the ounce; albumin, none. Microscopical examination: Large number of epithelial casts with epithelial cells.

For several days he has been given bread and rice. He has improved daily and sits up in bed. The heart sounds are clear and the lungs are in a good condition.

November 16: Urine for past twenty-four hours: quantity, 42½ ounces; color, pale amber; specific gravity, 1015; albu-

min, none; urea, 10 grains to the ounce; chlorides, normal in amount; small amount of sediment. Microscopical examination: Few granular casts; few large and small epithelial cells; some uric acid crystals and amorphous urates.

November 20: Nothing abnormal found.

November 26: The examination was negative.

The urine was examined several times after this, but without finding anything abnormal. The temperature was never above 99° F., and in fact was subnormal as a rule, being 97° F. on the 3d and 5th of November and 96° F. on the 6th. It was 97° F. also on the 7th and 9th of November. The pulse rate was from 60 to 90. The respiration ran from 18 to 26.

CASE II.—Colored, male, age 14 years. Family history negative. Has always been a healthy child. One week before applying to the Children's Hospital for treatment, the boy had a painful swelling at the angle of the jaw on the right side. This swelling still persisted, but the patient stated that it had decreased in size and was getting smaller. It was painful on pressure, and he could not open his mouth on account of the pain. Three days after this swelling was first noticed, he observed that his eyelids were swollen on getting up in the morning. This wore off during the day, but had reappeared each morning up to the time he applied for treatment. When he came to the dispensary there was well-marked edema of the skin of the entire body, especially well marked in the face and feet. He had been passing very little urine. A specimen was obtained and found to be of a normal color. There was a large amount of albumin, and on microscopical examination there were numerous epithelial and granular casts, with many blood corpuscles. As the boy was too old for treatment in this hospital or dispensary, he was referred to another hospital and told to become a ward patient. A physician told me that he had a well-marked case of orchitis at 7 years of age following the mumps. He made a perfect recovery.

Among the many organs which may become implicated during the progress of a case of mumps, the testicle is the one most often affected. Orchitis is a rare complication in childhood, as the gland does not appear to be liable to such trouble until after puberty. Henoch and Vogel, in their text books on diseases of children, state that they have never seen a case. Holt writes: " Of 230 cases [of mumps] observed by Rilliet and Barthez, this was seen in but 10, and only 3 of these cases

were under 15 years, and no case under 12 years old." It is usual to find it on the left side, as it was in my case, and on the same side as the mumps.

For some years it has been known that nephritis has complicated mumps, but there have been only a few cases reported. Burne, 1851, published "a case of epidemic mumps complicated with parotitis, orchitis, nephritis, albuminuria, convulsions; recovery."[1] This is the first time the subject was noticed. The patient was a boy 12 years old, who was taken sick on the 10th of the month. On the 24th the testicles became swollen, and on the 26th there were symptoms of inflammation of the kidneys. In three days the urine was free of albumin. Bienfait, in 1873,[2] reported a case of albuminuria following the mumps. In an epidemic of 117 cases of mumps observed by R. Demme, in 2 cases there was acute nephritis. The cases developed suddenly and were well in a few days. Henoch, Croner, and Isham have each reported a case. Musgrove and Slagle each saw a fatal case complicated with uremia.

Looking at the course the disease had taken, first the affection of the salivary gland, which subsided, then of the testicles and kidneys, it may be concluded that the action set up in the testicle and kidney was of the same character that was manifested in the parotid and due to the same cause. This view becomes more positive when we know that there are cases on record where the testicles were first swollen and the parotids became involved later. As Currier remarks: "The evidence is therefore abundant that we have in parotitis an infectious disease with multiple localization."

I should, therefore, urge the necessity of vigilance during the course of a disease so prone to infection of such important organs, and of attention particularly to the quantity of urine, and also to the testing of its character if there is any doubt.

During the febrile period the patient should be kept in bed, and in the house until well, unless the weather is warm and dry. As bruising of the testes is said to invite orchitis, these organs should be protected from traumatism.

913 SIXTEENTH STREET, N. W.

[1] Prov. Medical and Surgical Journal, London, 1851.
[2] Bulletin Soc. de Méd. Lyon.

POSTERIOR ROTATION OF THE OCCIPUT IN VERTEX PRESENTATION.[1]

WITH REPORT OF THIRTY CASES.

BY

STRICKER COLES, M.D.,

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NORMALLY in vertex presentation the suboccipito-bregmatic diameter of the child's head engages usually in the right oblique diameter of the pelvis, with the occiput in the majority of cases to the mother's left and in front; in the others the occiput is to the right side and behind.

When the occiput is behind, anterior rotation usually takes place, but it may rotate behind into the hollow of the sacrum. These are the cases I wish to report this evening. I have not seen engagement occur in the left oblique with the occiput behind. In all of the cases with posterior rotation of the occiput the engagement was in the right oblique or transverse, with the occiput to the mother's right side and more or less behind the lateral median line.

In 975 labors there were 925 vertex presentations, and posterior rotation occurred in 30 cases. Two exceptions should probably be made: in Cases 4 and 6 delivery was accomplished by high forceps, and in each of these the head was high up in the right oblique diameter, with the occiput behind, and, as the forceps were applied to the sides of the head, anterior rotation could not take place. This gives a percentage of about 3 per cent in all labors and about $3\frac{1}{4}$ per cent in vertex presentation of posterior rotation of the occiput. The percentage of anterior rotation of the occiput when it was behind is very difficult to estimate, as many of the cases were not seen until rotation was already complete. The most common factor producing posterior rotation was incomplete flexion as the head passed down through the pelvis; the occipital end, being the largest and passing through the smallest part of the pelvis, seems to meet with greater resistance; the sinciput, becoming the most dependent portion, would tend to rotate posteriorly.

[1] Read before the Section on Gynecology, College of Physicians of Philadelphia, May 18, 1899.

The next factor was the lack of an elastic, resisting pelvic floor. There were 11 multiparæ, and in all of these there were old lacerations which had not been closed at previous labors; also in some cases the pelvic floor was resisting and rigid, act- ing as a complete barrier to the progress of normal mechanism of labor.

In some cases the proportion between the child's head and the mother's pelvis was lost, the head being large and the pel- vis small. In one case the head was so soft and flabby that the mechanism of labor was not accomplished. In a great many of the cases the labor pains in the first stage were weak or of short duration. The average length of the first stage was about thirteen hours, the second stage four hours, and the third stage from fifteen to thirty minutes. The placenta was ex- pressed by Credé's method, a short interval being allowed for the uterus to regain its tone after the expulsion of the child.

The diagnosis was made by abdominal palpation; the feet and extremities of the child were found to the mother's left near the median line, with the back of the child to the mother's right and behind; the fetal heart sounds deep and to the mother's right side. On vaginal examination the anterior fontanelle, or the meeting of four sutures (at about right · angles), would be felt in front and slightly to the left side, and by following the sagittal suture backward with some difficulty the meeting of the three sutures (at obtuse angles), or the so- called posterior fontanelle, can be felt slightly to the mother's right side and behind. The diagnosis becomes often very difficult when the case is seen late, as the caput succedaneum has grown very large and obscures the sutures.

The treatment should be, first, to have the head engage with the occiput anterior; but if it has already engaged posteriorly, then to use the methods that do not require internal manipula- tion, such as placing the patient on the side toward which the occiput points, and with external manipulation direct the back anteriorly; this will usually produce anterior rotation if the uterine pains are stimulated. Delivery may take place without interference with the occiput posterior, as was the case in 6 of the cases reported; 4 of these were in multiparæ with very poor pelvic floor, due to previous lacerations, and 2 in primi- paræ where the pelvis was large and the child not above the average.

Three cases were converted into anterior position and labor proceeded normally. This was done by increasing flexion and

grasping the head between the thumb and fingers. placing the patient on the side toward which the occiput pointed or in the knee-chest position, and by external manipulation at the same time the head was rotated anteriorly, the patient then placed on her back, and labor allowed to proceed normally.

In 5 cases anterior rotation was accomplished as above and forceps applied and child delivered, as the head would either rotate posteriorly again or the mother was becoming exhausted.

In 15 cases the head was delivered in the occipito-posterior position with forceps; the head had become wedged into the pelvis from prolonged labor, or, as in 2 cases, by previous attempt at delivery by forceps. In 5 of these cases I tried to rotate the occiput anteriorly under chloroform anesthesia, but failed, as the head could not be dislodged. No attempts at rotation were made with the forceps or vectis.

In forceps deliveries where the occiput is posterior the handles should be held well up and the blades placed well back on the sides of the head, and traction should be made either with tapes applied after the method of Poullet or some other form of axis traction. This will increase flexion and make the delivery much easier.

Version was performed once. In this case forceps had been applied, and when I examined the case the head appeared so large that version was selected and a large child was delivered with some difficulty. There were 2 cases delivered by high forceps, and in each of these there was left facial paralysis in the child, which disappeared in from eight to ten days.

The perineum was torn in 12 cases, the pelvic floor in 6, and the cervix in 5. Episiotomy on the right side was done once to prevent a complete tear. There was no tear in 11 cases; all of these except one were multiparæ; in this one the child was small.

All of the mothers made good recoveries; 2 had slight postpartum hemorrhage, which was soon stopped, and uterus packed with iodoform and vagina with bichloride gauze. There was an elevation of temperature in 3, which dropped when the uterus was irrigated with antiseptic solutions and the bowels moved with salines. Two children were lost: one was still-born and had been dead for some time; the other was delivered with forceps and was badly asphyxiated, but was revived and died one and a half hours afterward.

No.	Name.	Age	Para	Previous labors.[1]	Measurements of pelvis.	Measurements of child's head.	Weight and length of child.	Length of labor.
1	B. K ...	19	1	....	26, 29, 31, 22,	13½, 12¾, 11¾, 9¼, 8½, 7¾, 9¼.	49, 8.	14, 3, ½.
2	Mrs. M McC.	21	1	....	20¾, 23½, 31, 20, 20, 19.	....	......	12, 2, ½.
3	M. W ..	20	1	....	....	....	......	32, 3½, ½.
4	Mrs. A. S.	32	M.	No histories of previous labors. Poor pelvic floor.	28, 30, 32, 22	14½, 14, 12½, 10, 9, 8, 10, 9½.	52½. 8.12.	6, 4, ½.
5	Mrs. L. B.	23	2	Normal. Old tear of pelvic floor.	24, 26, 29, 22, 22, 19½.	....	......	7, 2½, ¼.
6	L. L....	23	1	....	26½, 29, 31, 22½, 22½, 20¼.	15, 14½, 12½, 9¼, 9, 8, 9½.	52, 8.8.	10, 4, ¼.
7	Mrs. I. B.	36	7	All were forceps deliveries.	26, 29, 31, 22½, 22½, 20½.	14, 13, 12, 9½, 8¾, 8, 9½, 9½.	51, 9.12	18, 2, ¼.
8	E M....	22	1	....	27, 30, 31, 23½, 23½. 18.	14½, 13½, 12, 10, 9, 8¾, 9¼, 9½.	49, 7.	10, 3, ¼.
9	A. D ...	18	1	....	26, 27, 32, 23, 22½, 21½.	14½, 14, 12½, 9½. 8¼. 8, 9½.	51½, 8.4.	16, 3, ¼.
10	M. H ..	25	1	....	26½, 29½, 31, 25, 24. 21.	12¾, 12½, 11½, 9¼, 8¼, 7¾, 9½.	48, 6.2.	.....
11	B. J....	19	1	....	23½, 25, 30, 21½, 21½, 17.	12½, 12. 11, 8¼, 8, 7½, 9.	47, 4.6.	.....
12	Mrs. K. B.	25	1	....	28, 30, 31, 21½, 23, 20½.	15, 14, 12, 10, 9, 8½, 9¾.	49, 7.6.	12, 8, ⅓.
13	Mrs. M. C.	32	3	Both were normal.	28. 30, 32, 21½.	13½, 13, 12, 9¼, 8½, 8, 9¼.	49, 7.	3, ½, ¼.
14	L. K ...	24	2	Forceps delivery. Child dead	26, 28, 30, 19.	13¼, 12¾, 11½, 9¼, 8 7¾, 9¼.	49, 7.8.	12, 3, ½.
15	Mrs. N. S.	23	2	Normal. Tear of perineum.	24, 27, 30, 23, 22, 20.	14, 13½, 12, 10, 8½, 8, 11, 11.	53, 8.2.	12, 4, ½.
16	L. B....	19	1	....	26, 27, 31, 22½, 22½, 20.	13, 12½, 11, 9, 8½, 7½, 10, 10.	47, 6 8.	18, 3, ¼.
17	E. D ...	24	1	....	26, 29, 32, 22, 22, 20½	14, 13, 12, 9¼, 8½, 8, 10, 10.	49, 7.	6, 4, ¼.
18	Mrs. M. M.	30	6	All normal. Tear of perineum.	26. 30, 31, 24, 24, 20.	....	......	36 (?), 4, ¼.
19	E. McC.	21	1	....	26½, 29 32, 23, 23, 21.	14, 13, 12. 9½, 9, 8, 10½, 10.	53, 7.	6, 4, ¼.
20	Mrs. M. M.	22	3	Labors normal. Two abortions at three months. Old tear of perineum.	23½, 28, 32, 21½, 20½.	14, 13½, 12, 9½, 21½, 8½, 8, 10, 10.	48, 7.	4, 2, ½.

[1] Order of measurements: Pelvis, *A. S., C., Troch., R. O., L. O., E. C.*; child's head, *Max., O. E. M., T. M., Bip., Bit., Bm., Suboc. Breg., Trach. Breg.* Length of child in centimetres. Weight in pounds and ounces. Length of labor, first, second, and third stages.

No.	Name.	Age.	Para.	Previous labors.	Measurements of pelvis.	Measurements of child's head.	Weight and length of child.	Length of labor.
21	Mrs. S. R.	29	10	Two forceps; others normal. Old tear of perineum.	26, 28, 32, 22½, 22, 20.	13½, 13, 12, 9, 8½, 8, 9½, 9½.	48, 6.2.	26, 10, ¼.
22	M. C....	18	1	....	25, 26½, 31, 21½, 21, 19½.	14½, 13¾, 12, 10, 9¼, 8, 11, 10.	51, 8.	20, 4½, ⅓.
23	E. L....	19	1	... .	26, 27½, 29½, 22½, 23, 19.	14½, 13½, 12, 10½, 9½, 8½, 10, 10.	52, 9.8.	10, 4, ¼.
24	Mrs. M. E.	..	1	....	25½, 27, 31, 22, 21½, 20½.	13, 12½, 11½, 9½, 8½, 7¾, 9½.	49, 7.	6, 6, ⅓.
25	Mrs. L. E. E.	32	1	....	25, 27½, 33, 22½, 22, 21.	13½, 12½, 11½, 10, 9, 8, 11, 11.	48, 7.3.	12, 3, ¼.
26	L. W...	18	1	....	25½, 27, 33½, 23, 22¾, 19½.	13, 12, 11½, 8½, 7½, 7, 9, 9½.	46, 6.7.	14, 3, ¼.
27	Mrs. P. H.	22	2	Normal. Old tear.	26, 28½, 32, 2½, 23, 20	13½, 13, 11, 9½, 8, 7¾, 10, 9½.	51, 8.	12, 2, ¼.
28	Mrs. M. T.	20	2	Normal. Old tear of perineum.	28, 29, 31, 24, 23½, 20.	14½, 13½, 12, 10, 9, 8½, 9½, 10.	49, 8.10.	8, 3, ¼.
29	A. B....	21	1	....	25, 27, 29, 22, 21½, 18½.	13, 12½, 11½, 9, 8, 7½, 9½, 10.	49, 6.4.	12, 2, ¼.
30	A. S....	24	1	....	24, 26½, 29, 23½, 24, 19.	13½, 13, 11, 9, 8, 7½, 9, 9½.	46, 6.	12, 3, ¼.

1. Labor pains frequent and strong; occiput rotated posteriorly and was delivered without assistance. Tear of perineum. Mother and child did well.

2. Labor pains were good; occiput rotated posteriorly; flexion increased and occiput rotated anteriorly with hand, when labor proceeded normally. Small tear of perineum. Child and mother did well.

3. Came into Maternity in labor; head low and wedged into pelvis; delivered with forceps, with occiput posterior. Tear of pelvic floor.

4. Forceps applied high up, with head in right oblique and occiput behind. Child had left facial paralysis, which soon disappeared. Mother did well.

5. Labor occurred without interference, with occiput posterior. Mother and child did well.

6. Forceps had been applied and head wedged into pelvis. Could not dislodge it, so reapplied forceps and delivered with great difficulty. Tear of pelvic floor and perineum. Child had left facial paralysis, which disappeared in eight days. Mother did well.

7. Dry labor. Barnes' bags introduced and forceps applied and head delivered in occiput posterior. Tear of pelvic floor and perineum. Mother and child did well.

8. Head wedged into pelvis; delivered by forceps in occiput posterior. Tear of cervix and perineum. Mother and child did well.

9. Dry labor; pains good and strong. Barnes' bags to dilate cervix; delivery by forceps in occiput posterior. Tear of cervix and perineum. Mother and child did well.

10. Labor induced for toxemia with bougies and Barnes' bags; occiput rotated anteriorly with hand and forceps applied Tear of cervix, pelvic floor, and perineum. Mother and child did well.

11. Labor induced with bougies for toxemia; occiput rotated partially

anterior with hand and forceps applied. Head was delivered nearly trans-
verse; that seemed to be the greatest diameter at the outlet. Child was
asphyxiated and died one and a half hours after birth. Tear of pelvic
floor and perineum. Mother did well.

12. Head low down; forceps applied in occiput posterior. Tear of cervix
and perineum. Mother and child did well.

13. Child transverse; performed external version and ruptured mem-
brane. Head descended rapidly and delivered in occiput posterior. Mother
and child did well.

14. Pains good and strong; head low in pelvis; tried to turn head with
hand, but failed. Delivered with forceps in occiput posterior. Mother
and child did well.

15 Occiput rotated posteriorly, and delivery occurred normally in that
position. Mother and child did well.

16 Membranes ruptured early; inserted McLane's bags; rotated occiput
anteriorly; applied forceps. Small tear of perineum. Mother and child
did well.

17. Occiput rotated posteriorly; head low in pelvis; delivered with for-
ceps. Tear of perineum. Mother and child did well

18. Membranes ruptured thirty-six hours before she was seen. Could
not hear fetal heart sounds; head delivered in occiput posterior. No tear.
Mother did well. Child was dead; the head was soft.

19. Occiput rotated posteriorly and delivered in that position with for-
ceps. Tear of perineum. Child and mother did well.

20. Occiput failed to rotate anteriorly, even with assistance of position
and external manipulation; it was partially rotated with the hand after
two attempts—the last, with the patient in the knee-chest position, was
successful She was then placed on her back and delivery occurred nor-
mally. Child and mother did well.

21. Head wedged into pelvis; could not turn, so applied forceps and
delivered in occipito-posterior position. Tear of cervix. Mother and child
did well.

22. Head wedged into pelvis; could not turn; delivered with forceps.
Tear of perineum. Mother and child did well.

23. Forceps had been applied and head wedged into pelvis. After some
difficulty it was pushed up and podalic version performed. Delivery was
very hard. Tear of perineum. Mother and child did well.

24. Occiput delivered posteriorly; labor pains good and strong. Tear of
perineum. Mother and child did well.

25 Uterine contractions very strong; made three attempts to rotate
occiput anteriorly. Applied forceps and delivered in posterior position.
Episiotomy in right side Mother and child did well.

26. Rotated occiput anteriorly with hand; delivery was normal. Mother
and child did well.

27. Uterine contraction good; occiput rotated posteriorly and was de-
livered in that position. No tear. Slight postpartum hemorrhage. Child
did well.

28. Occiput rotated posteriorly; head low in pelvis; forceps applied and
delivered in posterior position. No tear. Mother and child did well.

29. Head was rotated anteriorly with hand and forceps applied. Tear
of perineum. Mother and child did well.

30. Brought into Maternity in apparent choreic convulsions; head low
in pelvis; occiput rotated anteriorly with hand and forceps applied. Tear
of pelvic floor. Slight postpartum bleeding; packed uterus with iodoform
gauze. Mother and child did well.

259 SOUTH FIFTEENTH STREET.

CEREBRAL COMPLICATIONS OF MUMPS.[1]

BY

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MARCH 13 I was called in consultation to see a young girl æt. 18 suffering with a metastasis of mumps to the brain. Some four or five days previous she first showed symptoms of the disease—then prevailing in her school—both parotids being involved. As the disease was light, little was seemingly thought of it, and she was permitted to go about the school building and pursue her studies. Two days preceding my visit alarming brain symptoms developed, and one of the leading physicians of the city was called in. I had the honor of meeting him on the 13th and concurring in his diagnosis of meningitis and cerebritis, due to metastasis, as all gland symptoms had suddenly ceased immediately preceding the brain complications.

All that science and skill, aided by the most unremitting care and skilful nursing, had been and was being done, as the disease was rapidly progressing unfavorably and developing most alarming symptoms. A grave prognosis was given the parents. She died the evening of the 15th in profound coma. There were no other complications.

On my return after my first visit to this patient, I received a call to M. T., a lad of 11 years, who also, the Wednesday preceding, developed his first symptoms of mumps. Thursday, March 9, both parotid glands were enlarged, sensitive, and exceedingly painful, the left gland much more so than the right. There was slight fever. As the disease was readily diagnosed by the parents, many cases already having occurred among his playmates, and as he did not seem "very sick," it was not thought necessary to call a physician. As the swelling of the face and neck increased, the submaxillary gland being involved, he was put to bed, kept warm, and given simple home remedies; bowels and kidneys acting normally; fever moderate. Saturday there was a rapid subsidence of

[1] Read before the Washington Obstetrical and Gynecological Society, May 5, 1899.

the swelling and pain in the region of the parotids. Sunday morning he complained of nausea and headache; bowels constipated; kidneys acting normally; some intolerance of light; eyes inflamed. Sunday night, high fever, delirious; complained of much pain in head; decided intolerance of light; nausea and vomiting. When I saw him he was in a darkened room, not bearing, without increasing pain in his head and through his eyes, sufficient light for me to clearly discern ordinary objects about his bedside; face flushed; conjunctivæ congested; head hot; complained of great pain in his head and nausea; had vomited during the morning; answered questions reluctantly and slowly—an unknown symptom in any preceding illness; wished to be let alone; drowsy and talking during sleep. His temperature was 104°, pulse 120, respiration normal or slightly below normal, 16 to 17. There was almost complete subsidence of the inflammation of the glands. The faucial mucous membrane was slightly inflamed, probably due to vomiting; kidneys acting scantily; urine high-colored, but otherwise normal; bowels constipated. There was nothing wrong with either testicle.

As the parotitis suddenly subsided on the third or fourth day of the disease, when it should have been at or near its height, and coincidently with this sudden subsidence the brain symptoms developed, with the foregoing picture fresh in my memory, I could but recognize this as a repetition, but with milder coloring and less alarming tendencies. Had not the inflammation of the parotids almost entirely disappeared, the brain symptoms might have been considered due only to high temperature. In no previous sickness had this been the case, however, when the temperature had run high for many days. But with the sudden subsidence of the parotid inflammation prematurely, and the brain symptoms due to no other cause, the most rational conclusion was metastasis of the poison or virus of mumps to the brain, and a threatening meningitis and cerebritis, if not already begun.

Perfect rest and absolute quiet in a darkened room was enjoined, cold applications to the head to be constantly applied, camphorated oil applied to the region of the parotids, which were protected by a covering of absorbent cotton held in place by a suitable bandage; a brisk calomel purge to be given at once, and tincture of aconite root and sodium bromide in liquor ammonii acetatis in full doses every two hours ordered. Diet, milk, chicken tea, etc.; water freely allowed.

Tuesday, March 14: Bowels freely opened by the calomel. Urine high-colored, but otherwise normal. Skin moist. Complains of less pain in the head. Eyes less congested, still painful to light. Temperature 101°, pulse 110, respiration normal. Wednesday, March 15: Much improved. Swelling of both parotids returned during the night. Left side very sensitive and much enlarged. Submaxillary glands again involved. He has little or no pain in the head, and his eyes are clear. He says he feels much better, but complains of pain and soreness behind and under the ear, especially on left side. Temperature 100°, pulse 90, respiration normal. His bowels and kidneys normal. March 16: Improving rapidly. March 17: No cerebral symptoms. Parotitis of both glands marked, but subsiding. March 21: Well and allowed to leave his bed and room.

Metastasis is "a shifting of an inflammation from an organ or set of organs to others not anatomically connected." When you know the specific organism or germ of a disease this can be readily proved. As little is known of the true cause of mumps or its virus—it is claimed that a bacillus parotiditis has been found—we meet with some difficulty in substantiating the theory of metastasis. Some day we may know more; until then I incline to the theory set forth in this report.

The return of the inflammation or disease to its legitimate seat, the parotid glands, followed immediately by a subsidence of the brain complications, is strong evidence to me that it was a metastasis. The same holds good when the testicles are involved in the male, or the ovaries or mammary glands in the female. The kidneys, as you know, are often involved. You will recall a most excellent paper by Dr. George Acker only a few weeks ago.[1] We have looked upon mumps as the mildest of all the diseases prevailing this winter, but it is not always non-fatal. Death sometimes lurks in its train and, despite all that science and human skill can do, claims its victim. It should, therefore, receive more thought and care at our hands than it does, and the laity be taught that rest in bed or in one room free from sudden changes of temperature, avoidance of violent exercise and all mental work, no matter how light, is necessary to the safety of the patient, if daily visits from the doctor are not.

1147 CONNECTICUT AVENUE.

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TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

TWENTY-FOURTH ANNUAL MEETING, HELD IN PHILADELPHIA, MAY 23, 24, AND 25, 1899.

JOSEPH TABER JOHNSON, M.D., *of Washington, D. C.,* *in the Chair*

Second Day—Wednesday, May 24.[1]

INVERSION OF THE UTERUS, WITH A REVIEW OF THE VARIOUS OPERATIVE PROCEDURES FOR ITS TREATMENT AND A DESCRIPTION OF THE WRITER'S OPERATION FOR CHRONIC INVERSION.[1]

DR. BERNARD BROWNE, of Baltimore, read a paper with this title. He said that inversion of the uterus was apparently more frequent in the olden times, and this was probably largely due to the sitting posture assumed by the parturient woman in those days. The method of treating inversion of the uterus recommended by Hippocrates consisted in suspending the woman, head downward, on a ladder, anointing the uterus with oil, and employing taxis. He had been unable to find the record of any cases of chronic inversion cured by operation prior to 1847. On August 26 of that year a new era in the history of inversion had been inaugurated, and one that had existed for sixteen months had been successfully reduced. Estimates as to the frequency of this accident varied considerably. Thus, according to the statistics of the Rotunda Hospital, during a period of one hundred and twenty-three years 190,833 women had been delivered, and yet only one case of acute inversion had been observed there. The person might suffer inversion of the uterus in several successive deliveries. In exceptional cases the process of inversion undoubtedly began in the cervix. Dr. Isaac E Taylor, of New York, in 1882 had elaborated this subject quite fully. Cases were on record in which the intestines had prolapsed into the depression left after inversion of the uterus. The speaker said that he had seen six cases of inversion of the uterus, two acute, one chronic, and three caused by intrauterine fibroid tumors.

Among the causes mentioned were: the upright or kneeling position during parturition, a short cord, distension of the uterus by an excessive quantity of amniotic fluid, severe

[1] Continued from p. 260 of August JOURNAL.

coughing, blows on the abdomen prior to labor, fatty degeneration of the uterine walls at the placental site, intrauterine polypi, sarcoma of the fundus, lifting heavy weights while menstruating.

Dr. Browne then reported a case that had come under his observation, that of a woman, 28 years of age, who had suffered from hemorrhage for six years following a confinement. During this time a tumor had been discovered in the vagina and had been diagnosticated as a fibroma She had first come under his notice in March, 1883, and the diagnosis had been chronic inversion of the uterus. Various methods of treatment had been tried for several months, but without success. In November, 1883, he had succeeded by an original operation in reducing this long-standing inversion, the operation having been completed in thirty minutes. It had consisted in making an incision into the uterus, dilating with a cervical dilator at first, and subsequently with Hanks' hard-rubber dilators, then sewing up the opening made and reducing the inversion.

Dr. ANDREW F. CURRIER, of New York, said that the operation of Dr. Thomas had been the one of choice with most surgeons, and it had occurred to him that that operation might be modified by the principle suggested by Dr. Browne. It seemed to him that the introduction of the dilator through the cervix in some cases might be productive of injury.

Dr. H. C. COE referred to an irreducible, though acute, case in which he had opened the abdomen and had succeeded in reducing the inversion. With the safety of abdominal section at the present time, it seemed to him much more certain, when there was a tightly contracted ring, to open the abdomen as soon as one was satisfied that the manipulation would be unusually difficult. The very fact that there was likely to be adhesion formed was in itself a strong argument in favor of this procedure.

Dr. H. A. KELLY said that he had been deeply interested in the account given in the paper of the old Hebrew method of delivering women. The description, however, was not quite so clear as would appear from our version. because on reference to the original it would be found that the description was capable of being translated in such a way as to make it appear that the word "stones" did not refer to the chair on which the parturient was supposed to sit, but to the "stones" or testicles of male children.

Dr. CHAUNCEY D. PALMER said that he had had considerable experience in inversion of the uterus, having seen probably fifteen cases occurring in the practice of various midwives. He had never had any difficulty in replacing the uterus when seen a few hours after the occurrence of the accident. With his thumbs he endeavored to indent the fundal wall at one side. The same procedure had been followed in the chronic cases. He had finally adopted the plan, in chronic cases, of keeping the patient on her back, irrigating the vagina with warm water, and applying large tampons moistened with boro-

glyceride. This treatment was kept up for several weeks, and the effort was made about once a week to indent the fundal wall and reduce the inversion.

DR. GEORGE TUCKER HARRISON said that, for the sake of history, he felt it his duty to say that he thought the reader of the paper was wrong as to the authorship of the method of uniting the os externum by silver wire sutures after the fundus had been passed through the external os. The credit for this procedure should be given to T. A. Emmet. Emmet's method was to spread the fingers apart in the vagina and endeavor to reduce first the part which came down last. He had seen the method work admirably in Emmet's hands. Reference was made to a case of acute inversion in which he thought he had possibly been to blame for the inversion, because of a faulty application of the method of Credé. The manipulation of the uterus according to the Credé method was only done while the uterus was in a state of contraction, and the inversion in his case had probably been produced by a neglect of this precaution. Another method of reducing chronic inversions of the uterus was by the prolonged and steady pressure exerted by a colpeurynter.

DR. HARWOOD, of Montreal, being invited to discuss the subject, said that he had had only two cases. One of them was an acute one occurring in a patient with a temperature of 104° F. and in very bad general condition. He had accordingly removed the uterus, but the patient had died within a few hours. His second case had also been acute, and as there had been a fibroma adherent to the uterus, and a few fibromatous nodules in the organ, he had performed a hysterectomy in this instance also and the patient had recovered.

DR. WATHEN said that a few years ago he had operated upon a case of complete inversion occurring in a woman 66 years of age. In this instance a fibroid tumor had been attached to the fundus. By persistent bimanual manipulation the inversion had been reduced in the course of about fifteen minutes.

DR. E. P. DAVIS said that one cause for inversion of the uterus was, as Dr. Harrison has stated, the misapplication of Credé's method. This method did not call for any dimpling of the uterus. He had seen recently three cases of inversion, in all of which the fundus had been dimpled by manipulations of physician or nurse in the effort to control a postpartum hemorrhage. Fibroid polyps or bits of retained placenta, by preventing proper contraction of the uterus, sometimes caused inversion.

DR. C. P. NOBLE said that he had never had a case of inversion of the uterus in his own practice, but had seen three cases in the hands of others. From the great difficulty evidently experienced in dilating the ring he did not look with favor upon this method. The application of force from below often caused a very serious degree of traumatism, sometimes necessitating amputation of the uterus.

DR. MAURY, of Tennessee, reported one case of chronic inversion. According to the statements of the patient the tumor had first appeared several days after delivery. Attempts had been made by prolonged manipulation to replace the organ, but without success. After that a colpeurynter had been tried with only partial success. Finally the cervix had been forcibly dilated and the inversion reduced, after which the lips of the cervix had been closed over the fundus by silver sutures, as described by Emmet. They had been left in for five days.

DR. BOVÉE said that the only case of inversion of the uterus he had ever seen had been met with in consultation last winter. On his arrival the patient had been comatose and evidently dying, and the uterus lay in the bed between her legs. On account of her low condition and the associated relaxation it had been comparatively easy to reduce the inversion. The patient had died a few minutes afterward.

DR. REUBEN PETERSON said that nothing had been said about the necessity for hysterectomy in certain cases of inversion. Reference was made to a case in which the Thomas method of abdominal section had been recommended but rejected. Two years later he had seen the woman riding a bicycle, and, on inquiry, had learned from her that she felt no inconvenience from her condition except a rather too free menstruation.

DR. BROWNE, in closing the discussion, said that a number of the points mentioned in the discussion had been referred to in his paper, but the short time at his disposal had prevented him from reading all that he had written. He had given full credit to Emmet for the silver-suture method alluded to by some of the speakers. The operation that he had proposed was original, and had been done by him and published ten years before Küstner's operation, or in 1883. Most cases of chronic inversion, unless caused by fibroid tumors, occurred seven or eight days after delivery. Amputation should be the last resort; it was a procedure very seldom demanded. In the past taxis had been carried too far; an earlier resort to operation was preferable.

IS A SLOUGHING PROCESS AT THE CHILD'S NAVEL CONSISTENT WITH ASEPSIS IN CHILDBED?[1]

DR. ROBERT L. DICKINSON, of Brooklyn, read this paper.
. DR. E. P. DAVIS said that those who had seen the nurses employed in European countries and contrasted them with the trained aseptic nurse in this country could readily understand the much greater frequency of umbilical sepsis abroad. The reason that umbilical sepsis was not more frequent in general was that the vessels were quickly occluded by aseptic blood clots. Some years ago he had reported to the American Pediatric Society a study made to ascertain the presence of infection in infants, as manifested by pneumonia, enteric discharges,

[1] See p. 14 of the July JOURNAL.

malaria, purpuric hemorrhages, and umbilical sepsis. In a considerable number of the latter class the source of infection had been demonstrated to be from the birth canal. The ligation of the cord should be preceded by crushing of the cord by means of an aseptic compression forceps. Then one aseptic ligature, drawn fairly tight, would be found quite sufficient. The stump should then be wiped with a sponge moistened with bichloride solution, and then dressed with a sterile pad. In this way the aseptic healing, so much to be desired, would result in the majority of cases.

THE USE OF COMPRESSION FORCEPS IN SALPINGO-OÖPHOREC-TOMY, WITH REMARKS UPON THE ANGIOTRIBE.

DR. I. S. STONE, of Washington, D. C., read this paper. He said that there was no reason why the ureters should be endangered by the use of this instrument in supravaginal hysterectomy. The cases treated by him had experienced almost no pain, in striking contrast with those treated by the clamp, wire, or ligature. Its action was totally different from that of the écraseur. The jaws of the instrument should remain parallel, so as to exert equal pressure on all portions of the tissues included in the grasp of the instrument. This instrument had also been found admirably adapted to operations on hemorrhoids.

DR. HANKS said that every case in which he had used the angiotribe had yielded a very satisfactory result.

DR. J. DUNCAN EMMET said that he had used Skene's hemostatic forceps with great satisfaction, and could not see any advantage of the angiotribe over these forceps except on the score of greater convenience in private practice. There had been a certain number of cases of hemorrhage in cases in which the angiotribe had been used, but it had not been clear that this instrument had been responsible for the hemorrhage.

DR. P. A. HARRIS said that while he looked favorably upon the angiotribe, he felt that one could not speak very strongly in its behalf until evidence from a much larger experience had accumulated. It was reasonable to suppose that an effort at vomiting might very easily cause hemorrhage in cases in which the vessels had been controlled by the use of this instrument.

DR. NOBLE said that he found it difficult to understand how such a large and awkward instrument as the angiotribe could be favorably received by surgeons. The ligature was a true and tried means of controlling hemorrhage, yet in his first ten cases there had been one case of hemorrhage, although none since that time. He could see no good reason for discarding the ligature. It was only under very favorable conditions, moreover, that the angiotribe could be applied, for in many cases it was difficult to introduce a needle, to say nothing of such a bulky instrument as the angiotribe. This method of operating appeared to him to be nothing more than a "fad."

DR. JOSEPH E. JANVRIN said that he had witnessed the use

of the angiotribe by Dr. Clement Cleveland, and could testify to the beautiful action of the instrument and the absolute success achieved with it. In his own vaginal operations. such as hysterectomies, he still clung to the use of the forceps In cases of vaginal hysterectomy for cancer he was accustomed to apply one large forceps on either broad ligament, and very frequently removed them in the first twenty-four hours and always after forty-eight hours. For these vaginal operations he was inclined to think that the angiotribe, applied for a few minutes, was preferable to large clamps kept in position for twenty-four or forty-eight hours, for the reason that much pain and nervous irritation were thereby avoided. This feature of the treatment appealed to him most forcibly.

DR. GOFFE thought the keynote had been struck by the last speaker when he had mentioned the advantage of the short application of the instrument. His first impression of this instrument had been that it was very clumsy and that its application would prove to be very tiresome to the operator. If, however, the latter held the instrument while an assistant turned the screw, the objection on the score of tiring the surgeon would be disposed of. In two vaginal hysterectomies in which he had employed the angiotribe the result had been all that could be desired. He had found that the application of the instrument for two minutes, twice on each side, was sufficient to control all of the vessels in a vaginal hysterectomy. He could not, therefore, agree with Dr. Noble in dubbing this a fad; on the contrary, it was a distinct step in advance and decidedly shortened the operation.

DR. GEORGE M. EDEBOHLS, of New York, said that as he did not use the clamp in vaginal hysterectomy, it was for him simply a choice between the ligature and the angiotribe, and the selection must be determined by each operator for himself. He had found it rather difficult to be sure that there was nothing in the terrible jaws of the angiotribe that was not wanted there. It could only be done by passing up two fingers to the very tip of the jaws each time before the tissues were grasped. Personally, he could apply the ligature more easily in a difficult place than an angiotribe in the same place; moreover, it was more dangerous to apply the angiotribe high up without the guidance of the eye. He could apply a ligature just as quickly as the angiotribe, and felt sure that he could apply it a little more closely and hence produce less sloughing than with the angiotribe. He was using the instrument, and was convinced that it was capable of absolutely stopping hemorrhage, but he did not feel as if he was likely to use it a great deal.

DR. STONE closed the discussion. He said that it was hoped that in time the angiotribe could be so constructed as to furnish the same power as at present and at the same time be less bulky. Skene's hemostatic forceps were most excellent, but even in hospitals the proper electrical equipment was not always at hand.

THE TREATMENT OF BROAD LIGAMENT CYSTS BY VAGINAL INCISION AND DRAINAGE.

DR. T. J. WATKINS, of Chicago, presented this paper, which dealt only with non-pedunculated cysts. The author thought that from a theoretical standpoint the danger of the refilling of a simple broad-ligament cyst after incision and drainage should not be much more than the refilling of a hydrocele after such treatment. By means of the vaginal incision the diagnosis between intraligamentary and other cysts was easily determined, in most instances by the relations to the peritoneum. The patient should be prepared in the usual way for abdominal operations. An incision one inch or one inch and a quarter long should be made in the posterior vaginal wall and care taken not to open the peritoneum. A small opening having been made into the cyst, it was then enlarged, the contents evacuated, and the cyst and the vagina packed with a continuous strip of gauze. After forty-eight hours the vaginal packing and one-fifth of the other packing were removed and the dressing renewed. This should be done daily for about one week. If, after making the vaginal section, the cyst should prove to be malignant, it might be removed through the vagina or through an abdominal incision.

DR. PRYOR said that in 1896 he had published a paper and reported a series of cases of broad-ligament cysts operated upon through the vagina, and had also given his reason for entering the peritoneal sac—viz., for the purpose of inspecting the ovary and tube on the other side. These broad ligament cysts were not always unilocular; they were very apt to be bilateral. He had always made it a practice to rip out portions of the sac, and had never packed the sac. He had also made it a rule never to evacuate a cyst which extended up to the umbilicus. The advantage of the vaginal method was that one was able to palpate the interior of the cyst and determine the presence or absence of excrescences. In one of his cases so treated he had subsequently had an opportunity of inspecting the peritoneal cavity while operating for an appendicitis, and he had found no return of the cysts. These were cysts of retention and their fluid contents were always sterile and should not break down unless infected by faulty methods of operating.

DR. BACHE EMMET, of New York, said that some years ago he had made a study of this subject and had operated upon a number of cases by practically the same method, and with good results. Where these retroperitoneal cysts were of long standing, and there had been an extensive development of the vessels about them, one should not attempt to operate upon them from above.

DR. JANVRIN remarked that Emmet had certainly read his paper as long ago as 1890 or 1892.

DR. WATKINS said that nearly all authorities stated that simple broad-ligament cysts were unilocular. He had not

operated upon any of these cysts extending above the umbilicus. He saw no great advantage in opening the peritoneal cavity in ordinary cases, and it would certainly increase the risks of sepsis and of the formation of intestinal adhesions. The operation was not described as a new one, but as an adaptation of well-known principles.

Third Day—Thursday, May 25.

REMOTE RESULTS OF SHORTENING THE ROUND LIGAMENTS AND VAGINAL HYSTEROPEXY BY VAGINAL SECTION.[1]

DR. HENRY T. BYFORD, of Chicago, read this article.

VAGINAL CELIOTOMY.[2]

DR. A. LAPTHORN SMITH, of Montreal, was the author of this paper.

THE SCOPE OF VAGINAL WORK.

DR. J. RIDDLE GOFFE, of New York, presented this communication. He had employed the vaginal operation in almost every pathological condition met with in the female pelvis. He had used it constantly as an exploratory incision and considered it almost devoid of danger. He had been particularly pleased with the results of drawing out cystic ovaries through the vaginal incision and subjecting them to ignipuncture. Many such ovaries, which he would have formerly felt called upon to remove, he had succeeded in saving by this method. He was of the opinion that ninety per cent of cases of pelvic disease in women could be successfully treated by the vaginal incision and with less risk. In unmarried women retroversion was often due to a too short anterior vaginal wall: after having made an anterior vaginal incision it was possible, after shortening the round ligaments, to bring the cervix well upward and backward.

DR. A. PALMER DUDLEY said that several years ago he had read a paper before this Society advocating a method of anterior vaginal fixation by utilizing the round ligaments. He could report now one hundred and twenty-six consecutive cases of bisection of the ovary by laparatomy or vaginal celiotomy, with eighteen subsequent pregnancies. He was to-day able to report a case in which opportunity had been afforded for inspection of the parts by a subsequent laparatomy. The first operation had been done on November 16, 1898. At this time the ovary had been resected and an anterior fixation performed. The patient was 28 years of age and insisted that the ovaries should not be removed. She made a rapid and smooth recovery, but subsequently at the clinic a matriculant, who did

not know how to introduce a bivalve speculum properly, had injured her, producing a hematoma. When seen shortly afterward there had been many of the usual symptoms of an ectopic pregnancy. On March 28, 1899, he had opened the abdomen and had found what appeared to be an ectopic pregnancy on the left side. He had removed the left ovary, but not the right one, as it was in excellent condition.

DR. EDWARD REYNOLDS said that this vaginal operation was useful in a certain limited class of cases, but could hardly be considered a rival of ventral suspension. For minor cases of retroversion the operation was peculiarly fitted. After making the anterior incision the bladder should be dissected away upward and downward for a short distance, and then a suture inserted in such a way as to make an anterior vaginal attachment higher up.

DR. FERNAND HENROTIN, of Chicago, said that if one could examine the women passing along the street, one would find that in about one-third of them the uterus was carried posteriorly and yet gave rise to no symptoms. Nevertheless all physicians of sufficiently large experience knew that there would come a time when, by treatment and various methods of investigation, the physician would be able to exclude everything else and would be convinced that the patient could only be relieved by some procedure which would restore the uterus to its normal position. Undoubtedly it was exceedingly difficult to determine the relation between the physical condition and the symptoms presented, yet even in neurotic subjects an operation would often yield a good result. He considered that Alexander's operation was seldom called for, for the reason that it did not allow of sufficient thoroughness. Although he had been an ardent advocate of vaginal work, he preferred the abdominal route for conservative surgery upon the appendages. Work done in an open wound, under the guidance of the eye and with the aid of the sunlight shining into the wound, was far and away ahead of groping in the dark while operating. Having opened the abdomen and determined by actual inspection the true condition, Alexander's operation should be done in women of the child-bearing age and ventral suspension in others. It was all very well to avoid abdominal scars, but the man who operated through the vagina for simple conditions was bound to come to grief some day. It might do for the French or Germans to operate through the vagina, and then, if hemorrhage and other complications obstructed their work, to remove the uterus, but American uteri were not so easily disposed of. The vaginal section was chiefly of advantage in suppurative cases.

DR. PRYOR said that operations through the vagina might be divided into two classes—viz., those anterior and those posterior to the uterus. Any leaking of pus or from a vessel could not be as readily treated through the anterior incision. Early ectopic pregnancies could be treated by incision through the posterior cul-de-sac, and by a certain posture the parts

could be brought down and inspected, not only by the operator but by the bystanders. He would not indorse any conservative surgery on suppurating cysts of retention, but in the first stage of acute salpingitis an operation was very valuable. He claimed priority for the method of operating through the posterior incision.

DR. BOVÉE said that it should not be forgotten that every case should be a law unto itself. In every case of displacement of the uterus the cause of the displacement must be determined, so that the remedy could be properly applied. The operation of transplanting the anterior vaginal wall higher up was applicable to just one class, i.e., where the anterior vaginal wall was attached on the cervix too low, or where it was too short. If the retrodisplacement were due to relaxation of the posterior attachment, the effect of such an operation would be to pull the uterus still lower and hold it still further forward. He was inclined to think that the broad ligaments had as much to do with the suspension of the uterus as had the anterior and posterior ligaments. He agreed with Dr. Pryor that the infectious cases should be operated upon from below, and preferably, in most instances, through the posterior vaginal incision.

DR. W. H. WATHEN said that the argument against the vaginal method, that the surgeon must necessarily grope in the dark, did not have any real foundation in fact. It might apply if the surgeon adopted the common method, filling the vagina with a lot of retractors. Personally he used his fingers as retractors. In an experience of eleven years or more in vaginal work he had never wounded the ureter or bladder. It was impossible to do more conservative work by the abdominal route than was possible through the vagina.

DR. NOBLE said that he had drained through the vagina three suppurating cases of ectopic pregnancy. One of these had been operated upon about three months later for a very large hydrosalpinx.

DR. A. LAPTHORN SMITH said that, contrary to the opinion expressed last year by Dr. Wathen that ventral fixation would soon be discarded, he wished to say that he looked upon this operation as absolutely perfect. It was important in this operation to scarify the anterior surface of the fundus and stitch it with silkworm gut and leave it there permanently. If this were done an exceedingly strong suspensory band would be secured. In every case of retroversion without adhesions the operator should be able to effect a cure by Alexander's operation. Personally he did not feel justified in ever opening the abdominal cavity when another and safer method would do as well—even the one per cent of mortality should not be needlessly assumed. In vaginal fixation the uterus was attached to a movable point, and hence it could not be compared to Alexander's operation or that of ventral suspension. If it were right to remove the uterus in every instance where there were pus tubes, he would recommend the removal of pus tubes through the vagina. It should be remembered that the taking

out of the uterus shortened the vagina very much and brought trouble into the family. It seemed to him much more surgical to cut out a piece of an ovary and stitch up the gap with silk than to cauterize the tissue, because the latter would be fol- lowed by cicatrization and the inclusion of sensitive nerve fibres.

DR. GOFFE said that it was generally recognized as desirable that the uterus should not be anchored to a fixed point, but to a movable one; hence the advantage of shortening the round ligaments through the vagina. Personally he adopted Dr. Dudley's plan of stitching the round ligaments together and then suturing the end of this loop to the uterus. He saw no reason why ectopic pregnancies could not be as radically treated through the vagina as through the abdomen So far he had had no fatalities in his vaginal operations, and convalescence had been smooth and satisfactory. The after-treatment was exceedingly simple and could be carried out by the nurse.

TUBERCULOSIS OF THE KIDNEY AS AN INDICATION FOR NEPHRECTOMY.

DR. EDWARD REYNOLDS, of Boston, presented this commu- nication. He stated that tuberculosis of the kidney was not always the destructive process that it was in other organs. Some recent experiences had led him to believe that it was not infrequently unilateral and primary in that kidney, and that as such its clinical course was widely different from that usually described. When occurring in broken-down, profoundly tuber- culous constitutions it was a rapid and hopeless affection: but when developing primarily and on one side, in persons having fair general health, it was an insidious disease, characterized by only trifling symptoms, often extending over many years. Unfortunately during this stage it was commonly not recog- nized, although it was at just this time that he believed it to be curable. Success in the operative treatment depended upon the selection for operation of only those cases in which the patient remained for years in good general condition and in which the disease was chronic. All of these cases coming to him had been brought by their physicians because of moderate urinary trouble without any knowledge of the presence of serious disease. Almost invariably there was a marked tubercular history. A case of miliary tuberculosis of the kidneys had given a history of eight years' duration. Another patient had suffered for fully twenty years. Two patients had suffered from hematuria. None of the others had presented any symp- toms which could be differentiated from an ordinary inflamma- tory affection of the kidney. Some of the cases were charac- terized by pain referred to one or the other ureter, and, strangely enough, this pain was not infrequently referred to the sound side. His experience had taught him that in cases giving a history of debility and long-standing urinary difficulty the deteriorated health was dependent upon the disease of the urinary tract. By palpation of the kidney, inspection of the

bladder, catheterization of the ureters, analysis of the separate samples of urine, including an examination for tubercle bacilli, and finally by inoculation of guinea-pigs with the urinary deposit, the diagnosis could be established. In his cases he had done a simple nephrectomy, leaving the ureter, because he believed it would necessarily retrograde after the removal of its kidney. The enormous mortality which had attended this operation in the past had been in part due to the imperfect selection of cases and to the employment of the operation as a last resort. Improved technique would probably reduce the mortality. He had had two cases of tubercular ulceration of the bladder which had been cured by local cauterization. Where the general health was rapidly deteriorating under the influence of the tubercular process, he believed that the surgeon should refrain from interference and that medical treatment should be employed; but if the general health had resisted the tuberculosis fairly, surgical intervention would accomplish a great deal.

DR. NOBLE said that, while in general agreeing with the opinions expressed in this paper, he felt a little more hopeful than Dr. Reynolds regarding some of these cases.

DR. A. W. JOHNSTONE said that after having listened to the description of the good results of local cauterization, it had occurred to him that perhaps it would be better to cauterize and drain. There was a growing feeling that it was better not to sacrifice any renal tissue, and he always felt anxious, for a day or two after a nephrectomy, regarding the action of the other kidney. The cauterization might be accomplished in the course of several sittings.

DR. A. PALMER DUDLEY described a case in which he had first drained the kidney in an evidently tuberculous subject, and had afterward removed all of the kidney possible and established free drainage from the kidney to the loin. At the first operation eight renal calculi had been found and extracted. He could not now close the opening, and he was positive the woman would die on the table if he attempted to remove all of the kidney. This case was of interest because it showed that so long as any of the kidney remained it would be impossible to dispense with drainage.

DR. BOVÉE said that his only case of ureterectomy had been one in which a general surgeon had removed the kidney about one year previously and two or three discharging sinuses still remained. He had done the ureterectomy and removed an enlarged ureter, closed at its junction with the bladder and filled with a cheesy, tubercular material. If this ureter had been removed at the time of the nephrectomy the second operation would not have been required.

DR. REYNOLDS, in closing the discussion, said that the local cauterization that he had employed had been the application of the solid stick of nitrate of silver, and not the application of the actual cautery, for he was inclined to think that the former acted better. After a careful study of the cases of tubercular

kidney in which drainage had been employed, he felt that he
would be ready to try the method if the patient were ready,
but there had been published so many reports of protracted
and hopeless suppuration that he did not feel hopeful regard-
ing this operation. The case just reported by Dr. Dudley
seemed to him one in point.

CONSERVATIVE GYNECOLOGY.

DR. SETH C. GORDON, of Portland, Me., read a paper with
this title He said that unfortunately the term "conserva-
tive" had a different signification for the patient and the sur-
geon. To the patient it meant the restoration of health. The
days of old office intrauterine treatment had largely passed
away, he hoped never to return, as it had tormented the
patient, taken her money and time, and brought great dis-
credit upon the profession. He fully believed that many cases
of ovarian neuralgia were due to certain pathological changes
of the ovary which called for nothing short of vaginal or ab-
dominal section, for in no other way could the true nature of
the condition be determined. Dr. Chauncey D. Palmer had
written, a few years ago, a very suggestive paper on "Inter-
menstrual Pain," and he could himself recall several cases in
which the patient's sufferings had been ended by abdominal
section and removal of the ovaries.

The greater part of the present paper was devoted to a criti-
cism of a communication presented to this Society last year by
Dr. H. A. Kelly on "Myomectomy." His conclusions were:
(1) That myomectomy was attended by as high a mortality as
was hysterectomy; (2) that fibroids might develop more rapidly
after removal by myomectomy; (3) in all operable cases in
women past the child-bearing age hysterectomy was far more
conservative to the health than was myomectomy; (4) that
only in women within the child-bearing period was myomec-
tomy justifiable; and (5) that conservative gynecology meant
the saving of health rather than of diseased and useless organs.

DR. PRYOR said that as no surgeon could say, after having
removed one or more fibroids of the uterus, that there were no
more fibroids present, myomectomy was wholly out of place
from the standpoint of the surgeon desiring to effect a radical
cure. On the other hand, it must be admitted that in excep-
tional cases the patient would insist upon the preservation of
her genital organs, even at great risk to life, and then myo-
mectomy had a field. He thought that almost every one pres-
ent last year had been sorry when a master like Dr. Kelly
advocated a method which, if followed extensively by the gen-
eral surgeon, would lead to a mortality of 50 per cent.

DR. T. A. REAMY took issue with the statement that sur-
geons had no concern with the preservation of the woman's
generative organs except when she so desired. The surgeon
might be a master of modern technique, but he was not a true
surgeon, in the highest sense of that word, if he could not
justly consider the social and moral side of such a question.

Regarding the statement that it was impossible to say whether all of the fibroids had been removed by a myomectomy, the speaker said that more than one-third of all women (even white women) had small fibroids, but comparatively few of them ever experienced any trouble from that source. He had repeatedly removed tumors of large size by morcellation or internal myomectomy, and had cured the woman without sacrificing the uterus. Even though such a patient might develop more fibroids, it did not at all follow that they would give her any trouble; indeed, it was not at all improbable that she might die from some other trouble before that time came. No man had a right to say that the special organs given by the Creator were useless.

DR. A. PALMER DUDLEY said that he would never pledge himself to remove a woman's appendages or uterus until he had become convinced that they were absolutely useless. For ten years he had been conserving these organs to the women, irrespective of their desire or that of their husbands.

DR. BALDY thought the general tendency of the present time was to teach that the routine use of myomectomy was distinctly bad. There were comparatively few cases in which myomectomy seemed to be clearly indicated. The operation was illogical for several reasons One of these reasons was that the impulse that caused the growth of the first fibroid tumor was unknown and might cause the development of an indefinite number of these growths. In Dr. Kelly's paper of last year there was a very large percentage of cases in which it had been necessary to do secondary operations because of the recurrence of fibroids. Fibroids gave rise to two important symptoms—hemorrhage and pain. Pain was exceedingly common, and was certainly not relieved by myomectomy. It was true that God had given woman her special organs, but he had not given them to her and insisted that they should be kept in spite of disease and suffering dependent upon them. The feeling regarding the generative organs of women at the present day was largely sentimental. The woman had a right to choose for herself. The surgeon was not a moralist or a clergyman; his function was to relieve suffering and cure disease. Myomectomy was not an operation of choice, although occasionally an operation of necessity.

DR. C. P. NOBLE remarked that the percentage of recurrences in Dr. Kelly's cases last year was certainly not large, as had been alleged; it was only about one per cent.

DR. BALDY replied that sufficient time had not elapsed. In the future he felt sure the percentage would be found to be much larger than appeared from Dr. Kelly's communication.

DR. NOBLE said that in an experience of about thirty cases with myomectomy there had been no recurrences and only one death. In that case the fatal termination had been produced by heart clot. Whenever the functions of a woman's organs could be conserved without endangering her health, it was the duty of the surgeon to do so.

DR. HENROTIN said that, in his opinion, hysterectomy was *the* operation for fibroids, and that a special indication should exist for myomectomy. Myomectomy on tumors of moderate size or on multiple tumors was more dangerous than hysterectomy. The field for myomectomy seemed to him decidedly limited.

DR. GORDON, in closing the discussion, said that his paper had been intended as a criticism of Dr. Kelly's paper of last year on a class of cases in which he believed the general profession would not sustain the selection of myomectomy made. The woman had a right to insist that the surgeon should cure her, and hence myomectomy, in many of Dr. Kelly's cases, did not seem to him to have been the proper operation. This was the woman's standpoint, and it was also the surgeon's standpoint. If the woman elected to sacrifice certain organs in order to secure a restoration to health, it was the duty of the honest and conscientious surgeon to do it. In every case of fibroid upon which he had operated during the past year there had been from one to twenty fibroids, and it would have been impossible in every instance to have treated the case properly by myomectomy.

ABDOMINAL OPERATIONS FOR CONDITIONS COMPLICATING TYPHOID FEVER.

DR. J. WESLEY BOVÉE, of Washington, D. C., in this paper described a case in which an abdominal operation had been called for during the course of a typhoid fever because of an independent and incidental condition. Two cases were on record in the Surgeon General's Office of abdominal section done immediately after typhoid fever, one of them terminating fatally. The case reported was that of a woman who had been delivered a year previously by a physician who was known to have many cases of sepsis in his obstetric practice. At the time of her admission to the hospital she had had a hectic fever, and examination by Dr. Bovée had shown an extensive inflammatory exudate in the pelvis. After a few days the temperature had increased, and accordingly abdominal section had been performed and pus tubes on each side removed. As the temperature had kept up for the next two days after the operation, the suspicion of the presence of typhoid fever had been aroused. A day or two later this had been confirmed by obtaining Widal's reaction with the blood from this patient. The temperature chart was exhibited and confirmed the diagnosis of typhoid fever. The temperature had returned to the normal in thirty days after the abdominal operation, and she had made a good recovery. As the typhoid fever existed in the vicinity of this woman's home, it was exceedingly probable that she had had the disease in a mild form before coming to the hospital and had then suffered a relapse.

DR. H. D. FRY also reported a case of abdominal operation in a typhoid-fever patient in which the postmortem examination had confirmed the diagnosis of typhoid fever.

Dr. A. Palmer Dudley said that some years ago he had read a paper before the New York Obstetrical Society in which he had advocated laparatomy in cases of typhoid fever in which perforation had occurred or seemed imminent. It seemed to him a surgical procedure which was not only justifiable but demanded. The condition was very similar to appendicitis.

ETIOLOGY OF NON-MALIGNANT RECTAL STRICTURE IN WOMEN.

Dr. Reuben Peterson, of Chicago, presented a paper on this subject, but, at his request, it was read by title.

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Officers Elected.—The annual election resulted as follows: *President*—Dr. George J. Engelmann, of Boston. *Vice-Presidents*—Drs. Edward L. Duer, of Philadelphia, and Seth C. Gordon, of Portland, Me. *Secretary*—Dr. J. Riddle Goffe, of New York. *Treasurer*—Dr. J. Montgomery Baldy, of Philadelphia. *Council*—Dr. A. F. A. King, of Washington, D. C.; Dr. J. Taber Johnson, of Washington, D. C ; Dr. James B. Chadwick, of Boston; and Dr. E. P. Davis, of Philadelphia.

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TRANSACTIONS OF THE SECTION ON GYNECOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

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Meeting of May 18, 1899.

The Chairman, R. C. Norris, M.D., *in the Chair.*

Dr. Stricker Coles read a paper entitled

POSTERIOR ROTATION OF THE OCCIPUT IN VERTEX PRESENTATION.[1]

Dr. Edward P. Davis.—Some years ago I made a collection of 160 cases of posterior rotation of the occiput from the records of the Philadelphia Hospital, and of these 98 per cent rotated anteriorly without assistance. Only cases under constant observation during the entire progress of labor can be utilized for the study of this question. Many long and difficult labors, in which the physician sees his patient late in the labor, have been posterior rotation of the occiput in which the vertex has come to the front before the physician arrived.

It is eminently proper to lay stress upon the condition of the

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[1] See original article, p. 377.

pelvic floor in influencing posterior rotation. Many of the most difficult cases which we see are those in which a large occiput has rotated posteriorly and embedded itself in a relaxed and distended pelvic floor.

In using forceps in these cases it is very important that axis traction be used and in such a manner that the application of the traction be made as near the centre of the fetal head as possible. The appliances in use for making axis traction are most of them imperfect in this regard. Even the Tarnier forceps is inferior in this respect to the Poullet application, in which the tapes are adjusted to the forceps blade at the centre of the fetal head. In our experience the Simpson forceps, with axis-traction attachment opposite the centre of the fetal head, has been especially valuable in these cases. Where we do not succeed in obtaining rotation we must have the strongest possible flexion to avoid extensive tear of the pelvic floor, and this condition, in our experience, has been best secured by the instrument named.

Much can be done in these cases by placing the patient in a favorable posture for rotation and stimulating her labor pains. At the time of delivery, when rotation had not occurred and the forceps was employed, we have found great advantage in using Walcher's position, raising and lowering the thighs to increase or lessen the tension of the pelvic floor.

In explaining these cases to students the advantage of a simple nomenclature is very evident. These are not separate positions, but defective rotation in a labor otherwise normal. Hence, the nomenclature which recognizes but two positions and describes these cases as imperfect rotations carries in the very description an explanation of the abnormality and suggestion regarding its treatment. Students instructed in this manner obtain an excellent comprehension of this difficult subject.

Craniotomy for posterior rotation of the occiput must be a very rare occurrence, and is only justifiable when other complications, forbidding other forms of delivery, are present. During the past winter a patient was admitted to the Philadelphia Hospital who had been some time in labor and upon whom efforts had been made to extract the child with forceps. The patient was septic, and the child's heart beat, although perceptible, weak. The occiput was posteriorly on the right side, firmly embedded in the pelvic floor, while flexion had been lost, partial extension was present, and the chin was impacted upon the left side of the pelvis. An effort was made under anesthesia to deliver the child by restoring flexion and using forceps. This failed and craniotomy was performed. The mother perished from intestinal perforation by hardened feces. This is the only instance in my experience in which craniotomy has been justifiable in these cases.

Dr. CHARLES P. NOBLE.—I do not see as many labor cases as formerly, but some years ago I did see a great many cases, and during that time I saw but one case in which the occiput

rotated posteriorly. I remember a neglected case I was called to in which the occiput was down on the perineum: the perineum had sloughed, and in delivering the head the occiput was found to be posterior. Last year in private practice I had a case in which the head stayed posterior, and, although it was not large, it would not rotate in spite of intelligent efforts and was delivered over the perineum. In that case there was plenty of room, so that neither the child nor mother was in danger. Those are the only two cases in my private and consultation practice in which the occiput remained posterior.

I confess that my mental attitude has been that of Dr. Davis, that it was a most exaggerated position to assume that if the occiput remained posterior we should think of craniotomy. I should never think of craniotomy except under some such condition as that encountered by Dr. Davis. If not able to deliver with the traction forceps we would be able to deliver with the aid of symphyseotomy, and I should think the doctrine of doing craniotomy simply because we have a posterior position a most unworthy doctrine.

Two weeks ago I saw for the second time in my life occipito-posterior position of the head. I remember years ago meeting one such case, and I met another one recently. This was a primipara, 39 years of age. The head was tightly wedged in the posterior position. Unfortunately she was delivered with a very bad pair of forceps. This patient should have been delivered with axis-traction forceps, but unfortunately I had been called into the country, where I left my bag, and used a pair which the doctor had. The vagina was torn away from the pelvis sufficiently for me to put my hand in the opening. That was not the worst tear I have seen. I was called in under similar circumstances to sew up a tear, in which I found I could put my hand back of the rectum. I thought this was a striking example of the tremendous harm which a bad pair of forceps can do, even in the hands of one accustomed to use them. I felt it a very useful lesson that this forceps, although carefully used, should be able, because of its faulty character, to cause such an extensive injury.

Dr. R. C. Norris.—This is an exceedingly interesting subject. I have had a large experience in the management of posterior positions of the occiput, and it is an interesting fact that the majority of my consultation cases for the application of forceps are cases of posterior position of the occiput in which the doctor in attendance has failed to recognize, and has therefore been unable properly to manage, the complication. The important factor, it seems to me. is the early recognition of the failure in flexion of the child's head. If that obstacle can be overcome, the mechanism of labor in these cases is easily accomplished, whether the head is arrested at the pelvic inlet or anterior rotation of the occiput is delayed in the pelvic cavity. I have found, where the head was incompletely flexed at the pelvic brim. that manipulation with the hands or forceps will sometimes fail if the patient is in the ordinary position. With the

patient in the Trendelenburg posture the child's head will fall away from the pelvic brim and there will be sufficient room for the necessary manipulation.

I have thus been successful in drawing down the occiput and thus flexing the head. Strong uterine pains will then maintain the head in its flexed position. I have even applied the forceps with the patient in the Trendelenburg posture. If we thus secure and maintain flexion of the child's head, the head will enter the pelvis without further trouble.

Referring to the question of aiding anterior rotation as the head passes into the pelvic cavity, some authors have stated that pressure with the fingers will not succeed. I have found that in primigravidæ internal manipulations will not so frequently succeed in favoring rotation of the occiput, but in multiparæ the placing of two or three fingers behind the occiput, pressing during the pain, and holding them thereafter the pain has passed away, will secure rotation of the occiput as the head meets the resistance of the pelvic floor. In my experience with occipito-posterior positions arrested at the brim, I have never found it necessary to resort to version.

Another practical point is the management of cases where the occiput has rotated into the hollow of the sacrum. I consider this complication an indication for the use of forceps to bring about, first, flexion, and then extension of the head. These are the cases likely to be followed by extensive lacerations of the perineum, frequently involving the sphincter muscle. The only case of sphincter tear that I have had following a head-first labor was in such a case. I was trying with the Simpson forceps to carry out these manipulations, and found that the blades would not firmly grasp the child's head, the head being too small. While the nurse was preparing the Hodge forceps a violent uterine contraction forced the head out with the occiput posterior, and the sphincter was torn. It has been my habit to impress upon my students the dangers of lacerations of the sphincter in these cases. The failure to manage properly occipito posterior positions of the occiput is due to the failure to understand the mechanism and to appreciate its mechanical difficulties.

DR. COLES.—I was glad to hear Dr. Norris speak of the Trendelenburg position. I have never tried the Trendelenburg position, but have that of the knee-chest, and in all the cases have found that the head is drawn back with a good deal of suction.

I have seen cases in which the head was rotated well round in front, but it would again rotate posteriorly. In one case the head was rotated anteriorly three times before it could be made to descend anteriorly. Why this should be I do not understand, but I have often seen this tendency to assume the previous position even when it is an abnormal one.

Another thing: in these cases, unless the forceps is applied well back, it never fits exactly and there is a tendency to slip. I have a great deal of faith in the Simpson forceps with

tapes, and when it does not lock well I find there is an occiput posterior or some other abnormal position of the head.

I have never had in occiput posterior very bad lacerations. None have been so deep that the sphincter was involved.

I do not believe that version is often indicated in these cases. In the one in which I did version, it seemed to me there was a better chance by version than with the forceps; on careful examination I found the head quite large. I put the woman under chloroform and managed to do a version. The child weighed 10½ pounds.

DR. CHARLES P. NOBLE presented a

REPORT OF THREE CASES OF OVARIOTOMY.

Some time ago I had occasion to operate upon three large ovarian tumors in one week. As large ovarian tumors are not common in my experience, and as these presented distinct features of interest, I thought I would present them to the Section.

The first case was that of Mrs. C., age 42, mother of one child, and whose history in the present illness contained nothing of interest. In December, 1898, she had grippe, and the physician in attendance observed that she had a large abdomen. This was the first time attention had been attracted to the condition. The abdomen enlarged very rapidly until she came under my care. There was nothing of special interest in the history. The tumor was operated upon and found to be papillary intraligamentous. In its removal at least six inches of the ureter came up with the cyst wall and had to be dissected off. The patient made a good recovery.

Of course the point of interest in this case is the method of dealing with intraligamentous ovarian tumors. We all know that a large percentage of ovarian tumors are papillary. In this case, as in most of them, I did a hysterectomy, which I think enables us to deal better with that class. If the patient is a young woman and the tumor is not malignant, I have ligated the ovarian artery on the side involved, and then have stripped the bladder in front of the uterus, and found the uterine artery and ligated that, and then peeled out the tumor. If the woman is of some age and the factor of child-bearing is not a question, and if the other ovary is involved, I think it better to do a hysterectomy, which enables us to control the vessels and do a bloodless operation. The patient made a good recovery and has since done well.

The next case I thought interesting to report because the tumor was a typical ordinary ovarian tumor in every way. That is the easy operation—the simple excision and tapping, the pulling out of a cyst. I found upon examination of a specimen that this was not a typical case, because, as has been the case with other tumors, there was dermoid development. This particular tumor had a dermoid pocket containing hair and one fully-formed molar tooth.

The next case was that of Mrs. T., age 34, mother of two children; always well until present illness. The history dates back three years and has been characterized by pain in abdomen and gradual enlargement of the abdomen. She came under my care in March. The operation has no features of special interest; it was a typical ovariotomy and the patient made a good recovery. The tumor contained one gallon of fluid. In my experience ovariotomies of this class are very rare. For one simple ovariotomy I am called on to do ten bad operations. The great bulk of ovarian tumors are suppurating cases and cases which have been looked upon as pelvic abscess cases, and not the ordinary ovarian tumor which was formerly met with. I believe the explanation of this is that a great many family doctors take out ovarian tumors, and the specialist is more apt to get the worst cases.

The next case is one interesting from several standpoints. Mrs. G., age 50 years, mother of three children; no miscarriages. The history begins in 1867, when she was operated upon by Dr. Washington Atlee for ovarian tumor by the old clamp method. At the time of the operation it was very curious to see the effect of the old clamp operation; it was the first time in my experience I had ever had that opportunity. A hysterorrhaphy from one side had practically been done, and you could trace the old pedicle in the abdominal wall. After the operation, from which the patient recovered by a very close shave, she became well and was married and had one child. The first child was born in 1869. Two and a half years later she was told that there was a fibroid tumor growing in the pelvis. It gave her very little trouble, and three and a half years later she bore her third child. In 1876 she noticed that her abdomen was increasing in size, and she was told that this fibroid tumor was growing. Until the present time the abdomen had been slowly increasing in size, but there had been no special symptoms except those of the weight and discomfort of carrying the tumor. During that time she was treated by many physicians for fibroid tumor and had taken muriate of ammonia by the barrel.

I operated upon the case on the 23d of February, and it proved to be a simple, ordinary ovarian tumor. Before operation there was no question whatever but that it was a cyst, but with the history of growing since 1871 there was considerable doubt about the diagnosis of ovarian tumor. But here undoubtedly we have as a fact that an ordinary ovarian tumor had existed for twenty-seven years, had grown very slowly, and had pursued a typical aberrant course. The patient made a good recovery and has done well. The points of interest are that the case was operated upon by Dr. Atlee by the clamp method, and, second, that an ovarian tumor should have persisted for so many years instead of pursuing its natural course and causing the death of the patient in about three years.

Dr. J. G. Clarke.—I think the dermoid cyst which Dr. Noble has shown is rather interesting, because it brings up the

subject of dermoid cyst lately published in an article by Kramer, of Breslau, in which is brought out the etiology of the tumor in a more perfect way than I have ever seen. If we represent the Graafian follicles up around the ovum we have, according to Kramer, the beginning of the dermoid cyst. It is rather peculiar in view of the fact that we have always considered that the dermoid cyst was a cyst which was entirely peculiar to itself; but according to Kramer, who has worked under Pfannenstiel, of Breslau, one of the best of the younger pathologists, the cyst starts out as an ovuloginous tumor, and in one or two instances he has been able to find that there is a very delicate vascular pedicle running out to the ovum. The tumor which Dr. Noble has described is apparently of the nature which Pfannenstiel has described as the dermoid cyst. Then this follicle may be extended to form either the ordinary ovulogue or the multilocular cyst. Under these circumstances we have the dermoid pushing out, which may form all the characteristic organs of the body. The cysts vary from the pure dermoid to the multilocular type. Evidently the cyst which Dr. Noble described belongs to the multilocular type with a small element of the dermoid. After the cyst starts to grow the multilocular part appears to grow more than the dermoid. Under these circumstances we would get only a small quantity of the dermoid and much of the multilocular. Not infrequently there will be neighboring multilocular cysts, and, breaking into each other, a small part of the dermoid will be transplanted and the hair and the teeth will grow out at this point.

The peculiar thing is the question of invitation to growth. As to this none of the men who have worked on the subject have apparently any idea. It hardly belongs to those cases of patho-genesis. We know that in the lower plant life the double sexual element is carried in one body. We find in the embryological elements more of the upper element. Kramer explains this on the ground that the head end of the embryo always grows first. The part which receives the blood first will spring into life. If there is a limited blood supply you will get a growth of the jawbone with a larger number of teeth and with the hair and with the brain tissue. It is a peculiar fact that we get the choroid pigment of the eye in these cases. Often you find the typical choroid and are not able to tell it from the normal choroid. We have complete representation of every one of the tissues. Kramer finds that the brain tissue is the chief one outside of the skin elements. He then finds lung tissue, in some cases liver tissue, and in one case evidences of the uterus—that is, uterus inside of one of these embryological structures. While in doubt as to the presence of the uterus, he says that more cases must be collected on that point. If, however, he finds that that is the truth, then we can at once see that we have a differentiation in the way of sex outside of the spermatic element. If we get the uterine processes in one of these dermoid elements, one must say that the differentiation

of sex occurs in the ovum without the influence of the sper-
matozoa.

The dermoid cyst part of it is practically a follicular cyst,
and the combined portion may be of the ordinary multilocular
cyst; it may be a part of the unilocular cyst.

The main point in the whole etiology is that dermoid cyst
per se is ordinary follicular cyst, and with that you may have
combined the multilocular cyst of the multilocular and uni-
locular variety, parovarian cyst having nothing whatever to
do with the dermoid.

DR. E. P. DAVIS.--I recall the case of an ovarian cyst in the
person of a market woman. The condition had existed for a
long time—certainly over ten years. The tumor was diagnos-
ticated as dropsy, and for a large part of the time she was un-
der vigorous medical treatment in the way of diuretics. The
abdomen was repeatedly examined by surgeons and physicians,
and always the verdict of dropsy was given. When this
patient came to operation the tumor was so large that the
patient was on one table and the tumor had to be put upon an-
other table. Tumor and contents weighed one hundred and
sixty pounds. Notwithstanding the excessive growth of the
tumor it had a pedicle no longer than a finger. The long
duration of the growth, the woman's ability to attend to busi-
ness, and its being diagnosticated as dropsy, coincide in some
respects with the remarkable case described by Dr. Noble.

PAROTID-GLAND THERAPY IN OVARIAN DISEASE.[1]

By DR. JOHN B. SHOBER.

DR. J. G. CLARKE.—I do not think I have anything to say
on the subject, particularly as I have had no experience with
the therapy. We can take up the remarkable effect on the
ovary of extracts from the glands and assume that there is a
possibility of there being some relationship. We know that
the latest investigations on the subject show relief of the
menopause symptoms by the use of ovarian substance, and the
treatment seems to be quite effective in those cases approach-
ing the menopause. As to the relationship of the parotid to
the ovary, I know practically little about it. As far as the
associated inflammation of the abdomen and parotid is con-
cerned. out of a pretty large list of operations I have never
seen a case of parotiditis associated with abdominal section. Of
course we know in cases of mumps we do have an associated
inflammation of the ovaries and testicles. The work which
Dr. Shober has carried out has been largely empirical, and it
seems to me will require a long list of cases, examining the
cases under anesthesia especially, before we can draw broad
conclusions as to the actual effect.

DR. SHOBER.—It is most important to establish a correct
diagnosis in all cases in which we wish to use this treatment
successfully. In doubtful cases I invariably examine the

[1] See original article, p. 368.

patient under ether.   I have had no success in cases of exten-sive tubal disease with adhesions and exudate, but in cases of enlarged, tender, prolapsed, and painful ovaries, cases of ovarian dysmenorrhea of long standing, the results of treat-ment have been invariably satisfactory.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of March 17, 1899.

Vice-President J. WESLEY BOVÉE, M.D., *in the Chair.*

DR. G. N. ACKER read the paper of the evening, entitled

MUMPS COMPLICATED WITH ORCHITIS AND NEPHRITIS.[1]

Meeting of April 7, 1899.

The President, THOMAS C. SMITH, M.D., *in the Chair.*

DR. I. S. STONE showed an

ANGIOTRIBE.

DR. JOSEPH T. JOHNSON presented

A LARGE MYOMA OF THE UTERUS, THE UTERINE CAVITY CONTAINING A LARGE POLYP.

DR. H. L. E. JOHNSON reported the following cases:

ATRESIA OF THE UTERINE CANAL WITH ENCAPSULATED SURGICAL NEEDLE—CYSTIC DISEASE OF BOTH BREASTS.

Atresia of the Uterine Canal after the Menopause.— On June 12, 1896, I read a paper before the Medical Society of this city, entitled "A Contribution to the Study of Atresia of the Uterine Canal after the Menopause, with Report of Three Cases," and on February 5, 1897, I read a paper to this Society on the same subject, reporting an additional case of the same disorder.   I now have the pleasure of reporting still another case of the same trouble.

I first saw this patient on August 14 last.   Her age is about 45, and she has been a patient of one of the members of this Society for the past ten years, during which period she was treated for Bright's disease and underwent an operation for

[1] See original article, p. 372.

the repair of laceration of the cervix. Reports of urine exam-
ined during the period stated showed at times albumin, casts,
low specific gravity, and deficient urea, but recent reports
show the urine to be normal. She is weak, pale, and tremu-
lous, complaining principally of nervousness, hallucinations,
insomnia, headache, pain in back and abdomen, digestive dis-
turbances, and an irritating leucorrhea   Menses absent about
one year, but irregular for some time previously.

Examination showed external superficial inflammation, vag-
initis, and an enlarged. fixed, and painful uterus with right
tube distended and cervical canal completely obliterated or
closed. The result of the old operation on the cervix is most
excellent. The vaginitis and erosions were treated in the
usual way, and on September 30, 1898, the canal was opened
with the uterine sound and incised with a bistoury. In mak-
ing the incision the knife came in contact with some metallic
substance deeply embedded in the cervical tissue near the in-
ternal os. Frequent dilatation was practised, and on October
13 I removed a portion of a Sims cervical needle which was
eroded and firmly embedded in the uterine structures. Since
the operation and the evacuation of the retained pus the
patient's symptoms and general health have greatly improved,
and the distended tube approached normal with disappearance
of adhesions and great reduction in the size of the uterus; in
fact, at this time the local conditions are apparently normal.

The presence of the needle in the cervix was a coincidence
and possibly not causative of the disease, but is interesting
clinically. This case is an atresia post menopause, but the
conditions which demanded trachelorrhaphy might be con-
sidered the exciting cause.

Cystoma Mammæ.—I present the right and left breast from
a patient from whom they were removed about three years
ago. I first saw this patient about seven years ago in con-
sultation with Dr. James C Young. She is married, white,
age 45, and has one child, grown. At that consultation we
noticed an ulceration of the cervix uteri, which was supposed
to be cancerous; she had a profuse, offensive, irritating, san-
guino-purulent discharge, but under treatment other than sur-
gical she entirely recovered. In 1895 I saw Dr. Young again
in consultation, this time for the treatment of a multiple
growth of the right breast which had existed at intervals for
about ten years. During the period stated the mass disap-
peared on two different occasions under some local treatment,
but during the past two or three months has grown very
rapidly. I made the diagnosis of cystic disease and removed
the breast with the superficial glands on May 15, 1896. The
wound healed promptly. At this time the left breast appeared
to be perfectly free from disease, but in about two months
showed evidences of cystic degeneration, growing rapidly
until October, 1896, when I removed that breast after the
manner of the first. This wound healed promptly and the
patient has enjoyed excellent health since.

On March 29, 1899, examination showed the cicatrices to be soft, freely movable over chest, and no glandular involvement. I did not report this case earlier, as I desired to wait for subsequent developments; as none have appeared by this time, the disease may be safely considered as cured.

Dr. J. Wesley Bovée had never been careful to hunt for small points of broken needles. The matter of occlusion of the uterine canal is interesting, and Dr. Johnson has worked it up well. There is considerable literature on the subject in all its variations. The two divisions are congenital and inflammatory; some of the latter occur during pregnancy. He saw the report of a case to-day; the woman was in labor, and not even a dimple where the os ought to be could be found. Those cases occurring after the menopause are due to inflammation.

Dr. I. S. Stone said his experience was mostly with cases after the menopause, though he had seen several cases occurring before this time. In a patient 45 years of age he did an endometrectomy. He opened the abdomen and took away two-thirds of the uterus, including the canal, in a cone-shaped piece, and sewed it up with catgut.

Dr. H. L. E. Johnson said these cases ought to be sought out, as many obscure symptoms can be relieved, and the cause is apt to escape notice.

Meeting of April 21, 1899.

Vice-President G. Wythe Cook, M.D., *in the Chair.*

Dr. Sinclair Bowen read a paper entitled

POSTPARTUM HEMORRHAGE.

Every case of confinement should be watched as though postpartum hemorrhage were expected. Cases which present more or less tendency to this accident are those (1) whose uterine contractions are, as a rule, not strong, and which often require the application of forceps; and (2) cases of feeble heart action causing a tendency to venous engorgement of the large uterine sinuses. In our routine examinations of the different organs of pregnant women we should note carefully the strength of the heart, not merely eliminate the presence of organic murmurs. A murmur, especially from mitral insufficiency with evidences of compensatory hypertrophy, in the absence of other signs, justifies a much more favorable prognosis as to postpartum hemorrhage, as well as sudden collapse after delivery, than a case with no murmur and yet with feeble pulse, perhaps slow or intermittent, or both. Such cases are greatly benefited by hygienic measures and the use of digitalis or strophanthus. This treatment may be given during the latter months of pregnancy and continued several months after labor. (3) Albuminuria should suggest postpartum hemorrhage.

Very recently several excellent works on obstetrics have appeared and the subject under consideration to-night has been thoroughly dealt with. Many methods of treating this condition are advised, but it seems to me that we are not taught with sufficient clearness "what is the very best plan which will most quickly and surely check the hemorrhage." The use of hot-water intrauterine irrigation is a very valuable agent and stands high in the estimation of some, but it has a few serious disadvantages in its application. Cold applications are not reliable; when too long applied relaxation of muscular fibres follows the contraction of first contact. Electricity is but rarely available for this emergency, and when the hemorrhage has been controlled by its use we feel no assurance it will not recur when the agent is withdrawn. The hypodermatic injection of ergotol is of value if there is a competent nurse or assistant present to administer it, otherwise the attending physician is unable to do so until he has checked the hemorrhage by more positive means. I desire only to emphasize two points: (1) That some definite line of procedure should be decided upon before hemorrhage occurs. (2) To add my testimony to the value of the gauze tampon to control postpartum hemorrhage occurring after delivery of placenta. What kind of gauze shall we use? In an emergency a clean handkerchief or strips from a towel have been quickly introduced into the uterus, but in ordinary cases of labor there is usually sufficient time to place the gauze and forceps in readiness for immediate use. The plan which I have followed for several years is to carry in the top of my obstetrical bag a small pan containing the gauze and long curved forceps with a few other things wrapped in a sterile towel, and spread upon a convenient table before the time it may be needed, and sufficiently near the patient to be in easy reach. I prefer plain gauze to iodoform because of the possibility of poisoning, and upon this plain sterilized gauze I squeeze the juice of a fine lemon which has been peeled with aseptic precautions and cut in two. After the delivery of the infant two pinch forceps can be applied to the umbilical cord and the latter cut; by so doing the attending physician can keep one hand upon the fundus uteri, using the other for the cord. If a ligature is first applied it requires both hands to do it, and the ligature can be more securely placed later on after we can safely leave the mother. One distinguished author has recently published in detail the method of applying the gauze tampon for controlling postpartum hemorrhage, with a picture illustrating the same. It is advised to place the patient across the bed in dorsal decubitus, thighs and legs being well flexed; the uterus is caught and drawn down, and the gauze applied with as much ease and comfort as after an ordinary curettement. This seems very good, and in hospital practice. with the patient upon a high delivery bed and plenty of assistance at hand, it may be practicable, but certainly not in private work, nor do I think it necessary in either to change the position of the patient or to

call in assistants other than the nurse at hand.   I suggest the following four steps to check postpartum hemorrhage, one or more or all of which may be carried out according to the severity of the case without unnecessary loss of time:

First, external manipulations, practically the same as used to deliver the placenta.   Seize and rub the uterus with one hand applied to the fundus, the fingers to the posterior wall and the thumb in front, until the uterus is firmly contracted and hemorrhage checked.   These manipulations will usually prevent hemorrhage and control all moderate attacks.   If the hemorrhage continues, while using external manipulations,

Second, pass the other hand into vagina and two fingers into uterus, removing all clots or débris that may be present.

Third, if the hemorrhage still continues, seize the forceps armed with the gauze and pass it to the fundus uteri, guided by the hand in the vagina, no speculum or change in position being necessary.   The presence of a mere strip of gauze is usually all that is needed to promptly check the hemorrhage. During the third step, which requires the use of both hands, the nurse holds the fundus uteri.   The hand remains in the vagina a few moments, and if the hemorrhage is not controlled then make use of the

Fourth step, which consists in packing uterus and vagina with gauze and applying a T-bandage and compress over fundus uteri.   The gauze may remain in place about twenty-four hours, rarely requiring a second application,

DR. JOHN F. MORAN said grave hemorrhage after labor is rare and is often due to carelessness on the part of the attendant.   Yet there are unavoidable cases, which may be due to placenta previa, fibroids, plural pregnancy, amnial dropsy, protracted labor, partial detachment of the placenta, albuminuria, hemophilia, etc.   He had seen several cases of postpartum hemorrhage due to fibroids, and in one was called just as the patient was expiring; possibly the prompt use of suitable measures may have averted the result.   He also recalled a case of placenta previa of the marginal variety, in which there was concealed hemorrhage before delivery.   This case was terminated successfully by the high forceps operation, and was followed by an alarming postpartum hemorrhage, but was readily controlled by the hot-water douche and hypodermatic injections of ergot.   Several years ago he was called to see a patient who was confined by a midwife two hours previously.   The patient's distressed countenance, weak, thready pulse, and gasping for air suggested hemorrhage, and an examination revealed the uterus greatly enlarged and filled with more than a quart of clots.   The uterus was emptied and an intrauterine douche of hot water was given, with the desired result.   The prognosis will depend on the time of the onset, the character of the discharge, and the amount of blood lost.   Thin, serum-like blood without clots is suggestive of hemophilia, and the danger is very great.   As to treatment, the important point is to secure contraction of the uterus.

This may be accomplished in two ways, used singly or con-
jointly as the case demands. It is necessary to have absolute
quiet. The foot of the bed should be raised, the uterus com-
pressed, and a hot intrauterine douche of either sterile water
or salt solution, from 110° to 120°, used. The speaker has had
no experience with gauze packing, but in it he recognizes a
very valuable agent. To counteract the loss of blood, salt
solution, subcutaneously, intravenous, or by rectum, is very
valuable.

DR. M. F. CUTHBERT said you might as well play the stream
of water against the wall as to give a hot douche for a hemor-
rhage of importance. Tamponade is the very best means of
stopping the bleeding. He always saturates the gauze with
vinegar or lemon juice. Iodoform gauze he does not use
because of its odor and a possible idiosyncrasy of the patient;
the plain gauze can be made sterile. He doubted if the lemon
or vinegar is absolutely necessary. It is a mistake to deliver
the afterbirth too soon; the uterus has not yet overcome its
inertia and does not contract so well.

In some depleted women strychnia for a few months before
confinement is indicated. In the hemorrhage itself the gauze
is so efficacious that it should be used at once.

DR. H. D. FRY said all means for stopping hemorrhage
should be prepared in every case of confinement; also all efforts
made to prevent it, as following down the uterus with the hand
and holding it until the patient is washed. He was accus-
tomed to prepare by having ice, lemon peel, hot-water douche,
and lately gauze; now he has cut out everything but the gauze
and hot douche and a needle for salt solution. Electricity is
not practical for postpartum hemorrhage; you cannot stop for
it. He carried a battery for several years, but gave it up. He
has gauze ready on a long pair of forceps made for the pur-
pose. He did not agree with Dr. Cuthbert as to the hot
water; if water is used hot enough it is easily applied and is
efficacious. In one case of his, gauze did not stop the hemor-
rhage. The patient was delivered with forceps and bled some;
a vaginal douche was given, then an intrauterine, then another
very hot intrauterine and gauze packing. In two or three
hours she was still bleeding. He then took out the gauze and
thought the hemorrhage might be from a torn cervix, but
found it not so; as fast as the clots were turned out of the
uterus they reformed. He packed the uterus again and forci-
bly flexed it, which effectually controlled the hemorrhage.
The gauze acts mechanically; there is no need of saturating it
with vinegar. There is no advantage in the use of iodoform
gauze.

DR. H. L. E. JOHNSON said from his personal observation
he would exclude all the remedies except the hot douche and
compression. Among the causes were a relaxed uterus after a
long labor, and retention of small pieces of placenta. If the
latter, the hand should be introduced and the membrane with
clots removed. The water should be 120°F. or hotter. He has

had no experience with gauze, nor does he favor it; a small dilatation, as by a clot, will cause hemorrhage, and he thinks the gauze not rational. He uses a tight bandage with a compress over the fundus.

Meeting of May 5, 1899.

The President, THOMAS C. SMITH, M.D., *in the Chair.*

DR. J. WESLEY BOVÉE showed a

DOUBLE PYOSALPINX

which, he said, illustrated the effect of latent gonorrhea. The patient was 24 years of age, four months married, and had had no trouble before. The husband had gonorrhea five years ago and had seen no discharge after a few months. Two months after marriage the patient became ill. Dr. Bovée opened the abdomen and found a double pyosalpinx and adhesions above the uterus covering a large abscess.

DR. G. N. ACKER asked why, if the man had no discharge for five years and no bacteriological examination had been made of the pus, Dr. Bovée attributed the disease to the male member of the family.

DR. JOHN F. MORAN said we should be slow to accuse the husband. He recently saw a man who had had gonorrhea and still had the morning drop; after fifteen months of married life there was no pregnancy, and the man thought he might have infected his wife. She was examined and a mass found in the pelvis which turned out to be a dermoid cyst. The tube and ovary of the other side were not infected and were allowed to remain.

DR. BOVÉE said there was no history of infection in Dr. Moran's case. In his case the woman was well before marriage and was taken ill two months after. If a man has had gonorrhea and the wife becomes infected, it is to be supposed that he has infected her.

DR. THOMAS C. SMITH.—Some eminent authority has said that gonorrhea is more dangerous than syphilis, and I think it is.

DR. WILLIAM P. CARR told of a man who had had no discharge for eight months, but yet had infected a woman.

DR. E. A. BALLOCH said he had a patient who had gonorrhea a year ago; now there was no discharge, but the urine contained many shreds which showed a germ which looked like the gonococcus.

DR. J. R. BROMWELL read the paper of the evening, entitled

CEREBRAL COMPLICATIONS OF MUMPS.[1]

DR. G. N. ACKER opened the discussion. He was sorry to hear Dr. Bromwell use the word metastasis as he did. Mumps

[1] See original article, p. 383.

is an infectious disease, caused by a specific organism and propagated by the diffusion of that agent. The complications were generally with sporadic cases. Pressure on the jugular veins may lead to venous hyperemia of the brain, causing headache and sometimes delirium. Harvey Lindsay reported in 1851 in the *Virginia Medical Gazette* two cases of death from suppurative meningitis. Meigs and Pepper say they have not seen a death from brain complications.

DR. THOMAS C. SMITH said the report of Dr. Lindsay's two cases of mumps followed by meningitis had made a great impression on him. When meningitis follows mumps is it due to the parasite or the toxin? The parasite has not been identified, but if present it should be found in the brain after death.

DR. WILLIAM P. CARR said the germ of cerebro-spinal meningitis had been isolated; it is a diplococcus and not unlike the gonococcus. If the gland in mumps suppurates it is probably due to streptococcus infection following or incident to the specific infection. In the same way a few stray streptococci may cause a meningitis. Pus-producing germs are found in the blood of healthy individuals and might become active in some. In all the fatal cases of cerebro-spinal meningitis he had seen, the streptococcus had been mixed with the diplococcus.

DR. JOHN F. MORAN said he made a lumbar puncture in one case and found the diplococcus.

DR. BROMWELL said he did not see why Dr. Acker objected to the word metastasis. Foster gives as a definition the shifting of a disease from one organ to another not in communication anatomically.

Meeting of May 19, 1899.

The President, THOMAS C. SMITH, M.D., *in the Chair.*

DR. BOVÉE showed a set of

FETAL BONES

taken from the abdominal cavity one year ago. The patient had carried them for nine years. She had lived in a malarial country; had become pregnant soon after marriage. Labor occurred at term. Dr. Washington had been in attendance and had found it to be an ectopic pregnancy. Six years later she had a living child at term. A year ago she came under his observation and he found a mass in the pelvis reaching to the spleen, and she had passed a parietal bone per rectum. He had thought at first to cut down through the flank and take it out extraperitoneally. He concluded afterward to make the median incision; he found in the cavity the bones and a large amount of fecal matter. He packed with gauze and put in a drainage tube; she made an uneventful recovery. A number of cases are on record as having gone long beyond

term; one was carried for fifty years and found at autopsy; very few have been operated upon.

Dr. WILLIAM P. CARR read a paper entitled

MALIGNANT TUMORS OF THE BREAST.[1]

Dr. JOHN VAN RENSSELAER said most writers agree that traumatism is the cause of cancer. A great deal has to be determined yet as to the pathology. The idea of the germ theory, reasoning from analogy of other diseases, is interesting and worthy of consideration. At the Johns Hopkins Hospital the intracanalicular theory of cancer is being studied. Statistics show that the complete operation as done at present is most successful. All tumors of the breast should be removed at once, and if found malignant the radical operation should be done. Some writers say it is not necessary to remove the tissue from the thorax, but the possibility of the extension of the disease into the thoracic cavity should be considered. Paget's disease is often overlooked or treated lightly by the practitioner. The lesson is to examine the breast carefully with the palm of the hand, and operate at as early a date as possible.

Dr. E. A. BALLOCH said the main interest in Dr. Carr's paper is his statement that cancer is caused by the inhibitory action of nerve fibres on the cells, caused by some pressure. Assuming that the nerve so acts in a certain case, would it not rather cause a wasting or death of the part? Ribbert's theory, as noticed in the *Annals of Surgery*, is that cancer is a growth beginning in the connective tissue. Dr. Carr's operation is not unlike Willy Meyer's, which operation is better than Halsted's. He likes Dr. Carr's idea of beginning in the axilla. This is the most important part of the operation, and can be done while the operator is still fresh and the patient in good condition. The latter part of the operation, or amputating the breast, can be done with a few sweeps of the knife.

Dr. STAVELY said any surgeon attempting this operation should be prepared for every emergency, and quoted statistics showing that out of sixty-seven cases operated on, one-third had the glands of the neck involved. In tumors of the breast, when malignant, there is an infiltration into the surrounding connective tissue. An English surgeon advocated the removal of the tubes and ovaries for cancer of the breast. In the first case so treated the glands of the axilla and neck were involved. Four months after there was a very large amount of infiltration about the glands. In the second case the breast was removed; she rapidly became worse and died. He did not advocate the operation, but mentioned it as a matter of curiosity.

Dr. WILLIAM P. CARR said the reason that the chest is not more frequently invaded is that the lymphatics from the diseased area go to the axilla. Paget's disease *is* followed by

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[1] See original article, p. 354.

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cancer. Dr. Balloch spoke of cells dying from loss of nerve force, yet a small skin graft can be kept alive for a long time; he has seen a graft come off in the dressing, and, if put back, grow. It is not necessary to bring in the embryonic cell as a cause. It is not necessary to assume a germ, for we can account for the growth by lack of nerve force.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Uterine Pregnancy Mistaken for Ectopic.—Lepage[1] records several cases in which this error has been made, and one in which laparatomy was performed before it was discovered. Such mistakes may be due to the occurrence, during a normal pregnancy, of abdominal pain, hemorrhages, or appendicitis. In view of the rarity of ectopic gestations continuing after the sixth month, the writer urges great care in examination before diagnosing such a condition.

Ectopic Gestation.—J. Edgar,[2] in reporting a case of repeated ectopic gestation, lays stress on the following points: That rupture occurred in both tubes—in one at the end of the seventh, in the other at the end of the eighth week; that the small amount of blood lost was due to blocking of the rents by blood clots; that the patient had seven attacks of syncope at the time of the second rupture—these must have been due to shock, not to the hemorrhage. In this case there was an absence of any history of pelvic pain or other sign of tubal disease prior to the tubal pregnancy, and of any definite microscopic evidence of salpingitis in either tube. Edgar believes that tubal disease is not an essential cause of ectopic gestation. The patient had had four children during the last three and a half years before the first tubal pregnancy. Of 26 cases which have come under Edgar's care, nearly all have had a child a few years or months previously. He dissents from the view that in all cases of tubal pregnancy the other tube, whether diseased or apparently healthy, should be removed at the same time, on the ground that it may subsequently become gravid. The admitted rarity of repeated ectopic gestation makes such an event extremely problematic. Such being the case, we are not justified in rendering patients sterile. Many cases of normal confinements, subsequent to the removal of gravid tubes, have been recorded. He has had two cases of this kind.

Rupture of the Fornix Vaginæ during Labor.—Poroschin[3] observed the following case in a VIIpara 33 years old. The head had entered the pelvic inlet and the vulva began to distend, when the patient suddenly complained of severe abdominal pain and looked pale. Labor pains ceased. Forceps extraction being unsuccessful, the fetus was perforated and

delivered with the cranioclast. Uterus well contracted, slight hemorrhage. After expressing the placenta, coils of intestines and a piece of mesentery were found in the vagina. The patient suffered from severe shock, which precluded an operation, therefore the uterus was tamponed and the pelvis raised. Three days post partum, laparatomy, resection of the prolapsed mesentery, and suture of the utero-vaginal tear. Recovery.

Appendicitis and Pregnancy. — In a discussion upon the relation of these conditions, *Schwartz*[1] mentions a case in which a cause of error in estimating the patient's condition was the rapidity of the pulse, which was normally 104 to 112. The comparative insignificance of the lesion in some cases is shown by a case reported by *Bouilly*. The patient, who was pregnant six and a half months, was suddenly seized with marked symptoms of appendicitis, with blackish vomiting, temperature 104°, pulse 120 to 140. The operation was performed a day later, and within another day the patient had practically recovered. Notwithstanding the severity of the symptoms, the appendix was found to be simply long, slightly swollen, and containing muco-purulent fluid. Recovery followed, but abortion occurred forty-eight hours after the operation. *G. Fieux* reports a case which he mentions as supporting the idea of Abrahams that obstinate constipation should be considered an essential cause of appendicitis during pregnancy or the puerperium.

Eclampsia. — E. P. Davis[4] believes that toxemia is the cause of eclampsia. The diagnosis of toxemia is made by studying the action of the excretory organs. The urine should be examined for quantity, specific gravity, amount of urea, presence and character of the sediment. Especial attention must be directed to the functions of the liver and intestines. When close scrutiny indicates that the liver, kidneys, skin, bowels, and lungs are deficient in action, investigation of the nervous system will show that the patient is suffering from retained toxins. Should this condition be unrelieved, the weakest excretory organ will give way, and acute nephritis or hepatitis of acute toxemia will usher in eclampsia.

Cesarean Section. — In describing a successful Cesarean section performed a few days before term in a case of scolio-rachitic pelvis, Albert Martin[1] calls attention to the advantage of opening the uterus without incising the membranes, thus avoiding liberating amniotic fluid in the peritoneal cavity. He prefers to secure hemostasis by having an assistant compress the lower segment of the uterus against the pubis. For uterine sutures he employs silk or other resisting material, as he believes that catgut is too soon absorbed.

Porro Operation. — G. W. Crile[5] reports a case of this variety performed on account of an abnormally small pelvis. The mother and child both survived.

Sore Nipples and Mastitis. — Rubeska[6] has observed sore nipples in 40 to 50 per cent of nursing women. The sores

usually appear on the fourth or fifth day post partum. He advises as prophylaxis daily washings with warm soapsuds and pencilling of the nipples with sixty per cent alcohol and glycerin every other day; while nursing, warm soapsuds and sixty per cent alcohol twice a day. Sore nipples are treated with a wet dressing of three per cent boric acid. Energetic disinfection with 0.5 solution of corrosive sublimate, aspiration of the milk, and application of ice to the breast is Rubeska's treatment in beginning mastitis. If mastitis begins with chills and fever and painful infiltration of the glands. parenchyma- tous injection of three per cent solution of carbolic acid (two to three syringefuls) is advocated. In the author's experience this has never caused unpleasant symptoms.

Fat and Fecundity.—C. A. L. Reed [7] states that the ques- tion as to which is the cause and which the effect in a given case of sterility coexisting with obesity is best answered by the history of the case. The antecedent condition may generally be assumed to be the causal one. Thus in the case of a com- paratively young woman who takes on fat and whose increase of weight is followed by a corresponding decline of sexuality, there is a logical inference that the first condition is the cause of the latter. This is confirmed when a successful treatment of the obesity is followed by a spontaneous return of the men- strual and reproductive functions. The physiological condi- tions underlying the normal deposit of fat are those of abun- dant supply of nutritive material, normal digestive and assimilative functions, a free circulation, an absence of exces- sive muscular exercise. a normal metabolism, and the unob- structed elimination of metabolic products. Over these special conditions there is a trophic nerve control. most marked during the extreme activity of the nutrient functions in childhood and declining with their subsidence during senility. The most serious embarrassment from obesity occurs from the deposit of fat in and about the heart, with the resulting cardiac asthma, pulmonary congestion associated with cough and expectoration, and diminished secretion from skin and the kidneys. Long before this condition is reached sexual intercourse is aban- doned, if for no other reason, because of the stenocardia in- duced. When conception does occur in these cases, abortion at the third or fourth month is almost sure to ensue. Practi- cally every case of acquired obesity may be cured; but resto- ration of the genital functions is less certain. Cases with general anesthesia are the least amenable to treatment. Ple- thoric cases are more easily cured than those associated with anemia while the least tractable are those complicated with neurasthenia. The constitutional treatment of sterility due to obesity must vary according as the case is anemic or ple- thoric. simple or complicated, and must embrace a considera- tion of diet, exercise, bathing, medication, and general personal hygiene; while the local treatment must include all resources calculated to overcome manifest pathological states and to re-establish the functional power of the genital organs.

GYNECOLOGY AND ABDOMINAL SURGERY.

Incontinence of Urine.—H. Flouquet [13] holds that all operations for the relief of incontinence of urine by alteration of the diameter or situation of the urethra act by dividing the nerves supplying the urethra or meatus, or by freeing adhesions between the urethra or bladder and adjacent organs.

Constipation.—L. Adrian [14] advocates the use of ipecac for habitual constipation of women. this method of treatment having proved very satisfactory in his practice.

Cardiac Disturbances and Disease of the Sexual Organs.—According to Kirsch, [15] displacement and disease of the ovaries and abnormalities of menstruation are prone to give rise to cardiac symptoms. Chronic oöphoritis, tumors, and pelvic exudations are most apt to cause these disturbances, which most frequently manifest themselves in attacks of tachycardia. The most effective treatment is the removal of the irritating cause, but frugal diet, exercise, and wet pack to the abdomen are at times successful. Kirsch has observed angina pectoris as a complication of gynecological diseases, and also degeneration of the heart and dilatation of the ventricles in consequence of abdominal tumors.

Influence of the Climacterium upon the Course of Cardiac Diseases.—Kostkewitsch [16] studied the effect of the climacterium on 27 patients suffering from cardiac diseases, and states that compensation disturbances are unusually frequent during this period. The patients were able to perform their household duties until the advent of the period, when they began to suffer from palpitation of the heart and shortness of breath. The symptoms, at first only intensified during the menstrual epoch, gradually increased in severity and continued without intervals of relief. As menstruation became less frequent the patient presented marked symptoms of vasomotor disturbances. such as flushes, perspiration, vertigo, and muscular pains. Gradually the disturbances of compensation became more pronounced. Kostkewitsch observed that in patients with mitral insufficiency this became especially aggravated with the advent of the climacterium.

Hernia of the Ovary.—W. L. Bell [17] reports a case of this variety occurring in a woman 25 years old. The swelling was always larger and more painful during the monthly periods. The pain was relieved by rest and aggravated by work. Bell cut down and found the ovary apparently healthy, but so attached to the inguinal canal that it had to be removed. The ordinary operation for radical cure was done and the patient made a good recovery.

Connective-tissue Cells of the Ovary.—Schnell, [9] in a study of the ovaries of adults, observed in the albuginea a number of cells which, owing to their size and location. aroused his attention. Upon further investigation he noted that these cells were found only in ovaries of pregnancy, and he classes them as connective-tissue cells of the albuginea, which hyper-

trophy and grow during an ensuing pregnancy. An analogous condition is observed in the transformation of the stroma cells of the endometrium into the decidual cells, and the interstitial cells of the theca interna into the lutein cells under the influence of the maturing and rupturing Graafian follicles.

Histology and Histogenesis of Papillomatous Ovarian Cysts.—Uffenheimer[8] reports a series of investigations from the Berlin Pathological Institute, of which the following are the most important conclusions. Papillomatous ovarian cysts arise from proliferations of the surface epithelium (germ epithelium), which grows in the form of ducts, into the substance of the ovary. So far all investigations fail to demonstrate that these cysts might have their origin in the epithelium of the Graafian follicles. The occurrence of ciliated epithelium is the result of metaplasia, while the so-called psammom corpuscles represent a degeneration of epithelial cells These psammom corpuscles have been observed in the earliest stages. Hyaline degeneration of the blood vessels is a constant phenomenon in papillary cysts.

Cysts of the Corpus Luteum.—Fränkel[12] has succeeded in making cultures of gonococci from suppurating cysts of the corpus luteum, which again demonstrates the extent of the pernicious activity of these micro-organisms in the female organism.

Dermoid Cyst of the Tube.—Jacobs[10] has recently removed by vaginal hysterectomy a rare tumor—a dermoid cyst of the outer portion of the Fallopian tube.

Surgical Treatment of Uterine Cancer.—T. Landau[8] states that if the carcinoma has already spread to the vagina, then during the course of vaginal hysterectomy the posterior vaginal wall can be removed in its whole extent. When the anterior vaginal wall is affected the bladder should be examined with the cystoscope. When the carcinoma has spread to the parametria and the uterus is not greatly enlarged in size, vaginal total extirpation is indicated. And lastly, in a case of carcinoma of the uterus complicated with tumors or inflammatory troubles of the adnexa, vaginal hysterectomy can be performed. Only when the enlargement of the uterus, caused by the cancer itself or by complications, is so great that not even with the aid of vagino-perineal incisions can the parts be brought out *in toto* through the vagina, is ventral hysterectomy superior to the vaginal route. The removal is effected with the aid of clamps, not with ligatures, because with the crushing and necrotizing effects of the clamp upon the tissues grasped we can extend the operation to regions which the ligature cannot reach or where it must remain ineffectual. This method especially enables us to extirpate by the vagina approximately every carcinoma which is limited to the uterus. Of 123 cases operated on under the above-described indication, 8 died from the operation; in 48 the operation was done more than five years ago. Of these, 13—that is, 27 per cent—have remained well.

Cancer of the Uterus.—Lauwers[10] reports a successful

vaginal hysterectomy for cancer of the body of the uterus in a woman 55 years of age. The patient had had irregular bleeding and fetid discharges after the menopause. In connection with these symptoms, which he states may be caused also by gangrene of an intrauterine fibroid, he reports the case of another woman who gave the same signs after passing the menopause. In this instance the hemorrhages had resulted in such severe anemia as to suggest malignant disease. Microscopic examination of the uterus after vaginal hysterectomy showed only a marked hypertrophic endometritis. For the differential diagnosis of such cases the writer advocates intrauterine palpation, after dilatation, when necessary, of the cervical canal. Jacobs opposes the vaginal route as not allowing removal of the lymphatic system, which he believes is usually involved in cancer of the body of the uterus.

In an extensive discussion of the operative treatment of this affection, L. Picqué and P. Mauclaire [20] state that no histological variety of cancer of the uterus develops so slowly that vaginal hysterectomy can be considered sufficient, because invasion of the sacral, hypogastric, iliac, inguinal, and lumbar glands and of the other pelvic organs is so rapid. An early and extensive operation with removal of the ganglia, by the abdominal route, is necessary. Catheterization of the ureters often facilitates the operation and diminishes the danger of injuring them. Abdomino-vaginal drainage is of value in decreasing the liability to peritoneal septicemia, which is a very frequent complication.

E. E. Montgomery [19] states that cancer of the uterus is a local disease in its origin, which tends to invade the neighboring structures, but extends to the corresponding lymphatic glands much more slowly than in other parts of the body. The chief dangers of relapse are from nests in the adjoining tissues which have escaped removal, and reimplantation of fragments during the operation. The prognosis is still undetermined.

Sarcoma of the Uterus.—Druon [13] describes a case of sarcoma of the uterine mucous membrane with complete disappearance of the epithelial cells and transformation of the cavity of the uterus into a large cyst by obstruction of the cervix. Recovery followed total abdominal hysterectomy.

Anuria from Uterine Cancer.—Chavaunaz [21] records a case of anuria which had lasted three days. An extensive cancer of the uterus was discovered, and the right kidney was palpated as low as the umbilicus. Phlebotomy and saline injections relieved the anuria, but eight days later the latter were ineffectual. Lumbar nephrostomy formed a fistula from which all the urine flowed, none entering the bladder from the left kidney.

Ectropion of the Cervix.—A. Siredey [22] advocates paralled incisions as close together as possible for pseudo-ulcerations of the cervix. He has found that five or six such treatments usually effect a cure. The operation is painless; the slight

hemorrhage accompanying it diminishes the congestion of the uterus. Careful asepsis must be maintained and an iodoform dressing applied.

Atmocautery and Cestocautery.—Gerich [23] publishes a number of cases in which uterine hemorrhages and cervical catarrh were successfully treated through application of steam after Pincus' method. *Case I.*—Woman 26 years old. Aborted three weeks ago, since which time she flowed. Temperature slightly elevated; pulse 110; uterus in normal position, somewhat enlarged; os admits index finger; dilatation of the cervix and curettage of placental shreds; application of steam 110° for fifteen seconds; hemorrhage ceases, uterus contracts; rest in bed for five days, ice-bag over abdomen; reddish discharge, lasting about twelve days. Since then patient has remained well and menstruated regularly. *Case II.*—Woman 25 years old; has flowed for two months; temperature normal; uterus in normal position, slightly enlarged; atmocausis for fifteen seconds, temperature of steam 115°, followed by uterine colic lasting a few hours; otherwise no reaction; hemorrhage ceased; menstruated normal for six months, during which time she was under observation. *Case III.*—Woman 36 years old. Endometritis; muco-purulent discharge; menstruates regularly, seven to eight days; uterus in normal position; adnexa and ligaments normal; cervix hypertrophic and excoriated; dilatation of the cervix and application of steam 105° fifteen seconds; cervical scab spontaneously detached on the twelfth day; cervix covered with normal mucous membrane; leucorrhea ceased and patient remained well, menstruation lasting three days. *Case IV.*—Woman 35 years old. Aborted two days before admittance; incomplete expulsion of secundines; hemorrhage; temperature 38.8°; uterus enlarged, corresponding in size to the third month; adnexa normal; dilatation and curettage; atmocausis, 115°, ten seconds. Recovery without reaction. *Case V.*—Woman 48 years old. Metrorrhagia; several subperitoneal myomata; ergotin treatment without much benefit; dilatation and atmocausis; since then normal menstruation lasting four to five days. Under observation for seven months.

Stypticin.—Nassauer [24] reports further observations with stypticin from Gottschalk's clinic. Until recently all uterine hemorrhages, to obtain the largest possible experience with this remedy, were treated with stypticin, but now the indications are more clearly defined. Stypticin is antagonistic to ergotin. It does not produce muscular contraction, but acts principally upon the vasomotor nerves. It is only of benefit if the mucous membrane is intact, but in hemorrhages due to congestion or tumors of the adnexa its action is almost specific. Empirically it has been found to decrease the disagreeable symptoms accompanying menstruation. In endometritis fungosa it should not be administered except after curettement. It is also found very effective in excessive bleeding due to chlorosis, pthisis, and the climacterium. Good success is reported in the

treatment of dysmenorrhea; both pain and bleeding are de-
cidedly improved; this is ascribed to its action upon the vaso-
motor nerves.   If a quick effect is desired it must be adminis-
tered hypodermatically in 10 per cent solutions, 0.2 pro dosi,
otherwise tablets are advisable.   The injections are painless
and without disagreeable after-effects.   Solutions of stypticin
keep well for some time.

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DISEASES OF CHILDREN.

Abscess in the Sterno-cleido-mastoid.—Wetzel[1] reports
the case of a boy 3 years old who became ill, with restlessness,
fever, and swelling of the right side of the neck, developing a
boardy hardness. Incised under narcosis, no pus was found
until the sterno-cleido-mastoid itself was cut, when creamy pus
ran out.   A small cavity in the muscle was tamponed and
healed rapidly.   The abscess followed an inflammation of the
throat, the infection probably being carried by lymph vessels
to the deep cervical glands situated in the fascia of the neck
behind the sterno-cleido-mastoid, really in the posterior fold of
the muscle sheath.

Acute Gastric Catarrh.—In the course of a clinical lecture
on the diagnosis of this disorder, H. W. Syers[2] states that it
is not always due to error in diet, but may arise from unsani-
tary conditions.   When the tongue is thickly coated and the
breath offensive the condition points to gastric disturbance
pure and simple; and though such conditions also occur in en-
teric fever. still they are less commonly observed than in gas-
tric catarrh.   No importance can be attached to the condition
of the bowels.   Nothing is more usual in enteric fever of child-
hood than for constipation to exist from start to finish, and in
gastric catarrh diarrhea is by no means infrequent.   Enlarge-
ment of the spleen, when present, is a real help and points
strongly to typhoid, but its absence is no indication that the
disease is not enteric fever.   Further, an enlarged spleen in
tuberculosis is of frequent occurrence, so that when present
the diagnosis may still be that of tuberculosis rather than of
typhoid.   In children enteric fever frequently occurs without
any eruption whatever.   As a rule, in gastric catarrh the ab-
domen is not distended or tense, while in typhoid it is both,

but here again there are many exceptions. If, however, on repeated examination the abdomen is observed to be neither distended nor tense, the fact of this condition being present goes against the diagnosis of enteric fever. Much importance attaches to the mental condition. The drowsy, lethargic, indifferent aspect is of much value in the diagnosis of enteric fever or of tuberculosis, and especially when it persists. Such a state may occur in gastric catarrh, but if so it is not of long duration. Hence whenever this mental condition persists or becomes worse the more serious diseases may be confidently diagnosed. Cases of acute gastric catarrh may sometimes, and in the course of a few days from the onset, become complicated with a simple jaundice, in all probability due to an extension of the catarrh to the common bile duct. This is not of common occurrence, but should be kept in mind.

Balantidium Coli in Child Five Years Old. – Shegalow[3] bases his study upon the reported case, experiments with pigs, and the examination of the feces of a number of workmen in a slaughter house. His conclusions are: That the pathogenesis of the balantidium coli for man has not been positively proved; that infection occurs only through the encysted forms, which develop under conditions more complicated than simple drying; that the parasite develops only on diseased intestinal mucous membrane, and even individuals who have a good chance to become infected do not become so in health; that it lives in the intestinal mucus; that the prognosis does not depend upon the number of the excreted parasites, but upon the general condition of the patient and the degree of anatomical change in the intestine; and that the best remedy is large doses of tannalbin and bismuth. The feces should be examined in every case, especially in children.

Casein of Cow's Milk.—Carl Fisch[4] presents the results of experiments made to determine whether the casein of cow's milk is completely assimilated by infants. In order to furnish a contribution to the solving of this very essential problem, the author sketched out the following idea: Casein, and the residues of its digestion, are chemical bodies exceedingly rich in phosphorus. If, therefore, it were possible to determine the amount of organically combined phosphorus which appears in the feces, we might be allowed to make certain inferences as to its origin and as to the bodies with which it is linked. The organically bound phosphorus of the feces can be part of the casein and of its cleavage products, and it can be a part of the nuclein of the feces and of the lecithin. The lecithin is easily removed by thorough extraction with ether. It is, however, impossible to separate the nuclein phosphorus from the casein phosphorus. There is, nevertheless, a way in which a very exact estimation of the nuclein phosphorus may be achieved. The meconium consists only of the digestive juices, desquamated epithelium, some leucocytes, etc., and a determination of its organic phosphorus, therefore, gives a very fair idea of the nuclein phosphorus. The results thus

obtained were corroborated by analyses of the feces of breast-fed infants of varying age. In every case the author determined the relation of nitrogen to the organic phosphorus, and it is clear that the admixture of even small proportions of casein or of its derivatives must show itself plainly in a decrease of this quotient. To get rid of these inorganic phosphates the feces were digested with diluted HCl; a small amount of the organic phosphorus was dissolved in this way, but this amount can be computed exactly. The experiments proved that a part of the organic casein phosphorus is excreted unassimilated with the feces in babies fed on cow's milk. In trying to artificially replace the natural food we have to take into consideration every one of its constituents. One of the latter which has received very little attention is the organic phosphorus, of which certainly the rapidly growing infant needs a considerable amount. There are three combinations in which this element is provided for in the milk: it is contained in the casein, in the nuclein, and in the lecithin. In one quart of breast milk there are three grains of organic phosphorus, while the amount in cow's milk is five grains. If, therefore, for young infants we dilute the milk with two parts of water, the child receives only one and two-third grains, which amount is still lessened fifteen per cent by the excretion of pseudo-nuclein in the feces of infants fed on cow's milk. According to Bunge, the pseudo-nuclein is the only iron-bearing constituent of the milk. The fifteen per cent of it which is discharged unassimilated by an average infant, therefore, means a noticeable loss of iron also. Experience seems to teach us that babies thrive well on cow's milk of a much higher concentration than the one which would correspond to the composition of breast milk, and that in this way the deficiency of organic phosphorus is made up, too. Certainly this is the case, but whether that which to our limited vision appears to be a normal development should not rather be intrinsically invested with an unnoticed tendency toward a deviation below or above the normal, remains a question.

Cerebellar Abscess.—L. J. Hammond [*] states that the greater susceptibility of children to suppurative inflammations of the nasal and tympanic cavities,the mastoid cells,and the eye, resulting from the exanthematous diseases, renders them more liable to pyema of the encephalon than after this age has been passed. He believes that it is extremely rare to find abscesses, either from ethmoidal or mastoid pyema, as frequently in any part of the brain as in the cerebellum. This may be said to be the vulnerable area in childhood for pyemic conditions to develop. This may be due to the lesser density of the outer table of the mastoid bone and also of the nasal structures. The author's experience with 5 cases of cerebellar abscess during the past four years has been in children between the ages of $2\frac{1}{2}$ and 5 years, with no pyema in any other portion of the brain; while in adults, during that period, he has seen no case of cerebellar abscess, but 3 of abscess in the cerebrum; this leads him to

believe that in children from the beginning of dentition until the age of 5 or 6 years it becomes a matter of great import- ance to determine what definite line of symptoms, if any, would positively determine the existence of abscess in that por- tion of the brain. It may, with a degree of accuracy, be stated that, given a case of pyema of the sinuses accessory to the brain; or a history of trauma, with rapid loss of flesh and strength, rapid pulse and high temperature for the first seventy-two hours, followed by a decline in temperature and an increase of the rapidity of the pulse; with pronounced flexure of the ex- tremities; progressive increase in the dilatation of the pupils, never, however, becoming fixed; half-unconscious condition with uncontrollable restlessness: a peculiar indisposition on the part of the patient to obey requests made; the presence of sugar in the urine; slow respirations (8 to 12 per minute); tendency if standing to go toward one side; swinging of the hands, always toward one side; and entire absence of paralysis— given these symptoms, there is probably abscess within the cerebellum. The presence of sugar is a very important symp- tom and may indicate the size of the abscess, as we would scarcely expect the glycosuric area to be seriously affected un- less the pressure were sufficiently great to interfere with the fourth ventricle. Only by early recognition and prompt surgi- cal intervention of this disease can the present death rate of 100 per cent be lessened, and no time should be lost in tre- phining and evacuating the pus.

Foreign Bodies in the Larynx in Children.—J. Payson Clark[7] gives the following summary of a detailed article on the subject: Foreign bodies in the air passages are more fre- quent in children than in adults, but the mortality is lower in the former. Leaving out cases in which death is immediate or almost so from shock or mechanical obstruction, cases of foreign bodies in the larynx are less fatal than tracheal or bronchial cases. In all cases of supposed foreign body in the larynx in children a laryngoscopic examination should be made, unless the child is unusually tractable, under ether anesthesia. If dyspnea is urgent, tracheotomy may be done first. If a foreign body is visible in the larynx, an attempt should be made to remove it through the mouth before resort- ing to any cutting operation for its removal.

Hygiene of the Newly-born.—Fuchs[9] experimented with 15 infants, omitting the bath altogether. Icterus developed in 11, and the variations in weight remained within normal limits. The cord mummified with equal rapidity (third day) in bathed and unbathed infants, but the cord stump fell off earlier in those who were bathed. No severe umbilical infec- tions occurred, but in 2 cases there were some secretion and a temperature of 39° C. Of 17 unbathed infants, 7 developed a temperature over 38.5° C., while of 17 who were bathed, only 2 had such a rise. The cases show that the bath is not a for- midable source of septic infection when sterile umbilical dress- ings and bedclothes are used by attendants schooled in asepsis.

On the other hand, the daily bath is a necessary hygienic meas-
ure, in that it lessens the flabbiness of the tissues due to the great
loss of water in the newly-born, and improves sleep and appetite.

Infantile Cerebral Palsy associated with Epilepsy.—
Drs. L. Pierce Clark[10] and Edward A. Sharp, respectively
first assistant physician and medical interne at the Craig
Colony for epileptics, report 40 cases, 18 of which were males
and 22 females.   The causes of the palsy, as ascribed by rela-
tives, are various.   Four were apparently caused by acute ex-
anthemata, 3 by scarlet fever, 1 by typhus, 1 by whooping
cough, 1 by exposure to cold, 3 injury to mother and fetus, 11
by " prolonged labor and instrumental delivery," 2 by blows on
the head, 3 by imperfect feeding (?).   Meningitis was ascribed
in 1 case, and in several no adequate cause was given.   As to
the age of onset of the palsy, more than half of the number oc-
curred under 2 years of age.   The family history in all the cases
was neurotic.   Three cases were markedly affected by stigmata
of degeneration, both congenital and acquired.   Twenty-one
cases had left hemiplegia, 11 severe and 10 in slight forms,
frequently the arm alone remaining paralyzed; 19 cases had
right hemiplegia, 11 slight and 8 severe.   The symptoms of
onset were almost always uniform, consisting of vomiting,
physical prostration, and unilateral convulsions of the side
finally paralyzed; but in three cases they were general, lasting
from ten or twelve hours to two or three days, and occasion-
ally for two or three weeks, convulsive attacks occurring in
series.   The severity of the epilepsy appeared to be in inverse
ratio to the severity of the cerebral palsy upon which the con-
vulsions depended.   In 23 of the 40 cases under study the
epilepsy began in one year after the palsy, and in the majority
of such cases it came on as a permanently established disease
within a very few days of the onset of the cerebral lesion.
The character of attacks seen in the 40 paralytic epileptics was
almost always of the grand-mal type, occasionally petit-mal,
and in rare cases psychic in character.   They usually grouped
themselves in series, occurring at fairly regular periods.   One-
half had daily attacks, all had one or more attacks weekly.
A practical point of this study is that no amount of bromide or
sedative treatment by drugs can wash out the cortical dis-
ease upon which the epilepsy rests.   The absurdity and im-
potence of employing the drug treatment alone in such cases
is too apparent to necessitate further comment.   The treat-
ment of the condition probably can never be attended by
great results, but what little is to be hoped for must come
through physiological educational lines.   Only by the most un-
tiring and unremitting energy of the physiological teacher can
we hope to teach the unstable nervous tissue to be still, crip-
pled but still morbidly active.

Intussusception in the Newly-born.—Horn[2] reviews the
literature of this subject, finding only 6 cases reported.   To
these he adds a seventh occurring in a male child born at term.
Meconium was passed two hours after birth, and then several

times daily. Icterus developed on the third day, and on the fourth the child seemed to take less food. The next day the stools were green, the abdomen tense, and the child evidently in pain. Vomiting was repeated, but no stool could be obtained even after clysters were given. The icterus became very severe and the general condition grave. There was no tumor in the abdomen and no fever. On the morning of the seventh day death occurred. A diagnosis of intussusception had been made. At the autopsy no congenital malformations were found, but in the middle of the ileum there was an intussusception 5 to 6 centimetres long, easily reducible, but showing a few early peritoneal adhesions. Of the three cardinal symptoms (obstipation, vomiting, and passing of blood by the rectum), the last was absent because of the high position of the obstruction; no tumor was apparent because the distended coils of small intestine lay in front of the intussusception. The etiology cannot be positively determined, but probably the obstipation was largely a factor. Traumatism could be excluded.

Leukemia, Acute.—Louis Guinon and Justin Jolly [13] describe a case in a young girl of 15. The disease, they say, is rare, especially in France, where only 7 or 8 cases have been reported. Nothing is known as to the etiology, although it has been observed with some frequency after infections, as influenza and angina, or following traumatism. Its real nature is not well known, although the symptomatology, the fever, the changes in the blood, and the vesical lesions would lead one to suspect that it is an infection, but in the majority of cases no micro-organisms have been found. The disease is ushered in by chills and pains in the limbs and joints, or by hemorrhages from nose and mouth, accompanied by increasing weakness. When established the affection resembles anemia, but a febrile type of anemia with a special habitat, whose chief symptoms are swelling of the ganglia, inflammation of the mouth, multiple hemorrhages, fever, and a typhoid state. All the superficial ganglia are increased in size, but less so than in chronic leukemia, and are hypertrophied only in the region of the neck. The spleen is never much enlarged. The tonsils are not always affected, but sometimes they ulcerate and are destroyed. The gums bleed and are covered with a brownish, bloody exudate; the buccal mucous membrane is bleeding and ulcerated. Visceral symptoms and the hemorrhages resulting from them give rise to various accidents, as pain in the bones, hemiplegia of cerebral origin, and deafness from hemorrhages of the ear. The temperature has no typical course; the maximum varies and there are often marked oscillations. The urine is usually abundant, sometimes albuminous or bloody; it contains much uric acid and urea. Anemia is shown not only by weakness, but by cardiac or vascular souffles and by dyspnea. The patients die of hemorrhages or in coma; sometimes a superficial or a visceral suppuration will cause death. Three clinical forms of acute leukemia have been described—the *typical form*, with tumors of the ganglia, anemia, and ter-

minal hemorrhages; the *hemorrhagic form*, whose course resembles that of infectious purpura; and the *pseudo-scorbutic form*, the lesions of which predominate in the mouth, on the gums and tonsils. The blood changes (according to the results of researches obtained by Ebstein, Ehrlich, Fränkel, Bradford, and Schor, and reviewed by Gilbert and Weill) can be summed up as follows: Considerable diminution of the red blood corpuscles; the globular value diminishes at first and then rises; (as in pernicious anemia) a few nucleated red cells appear. Increase in the number of white corpuscles, especially the mononucleated cells; they do not contain basophile or neutrophile granulations; eosinophile cells are rare. The number of leucocytes is sometimes moderate, 22,000 to 27,000 in some cases, usually increases toward the end, but rarely goes beyond 50,000 to 80,000. The authors give a detailed description of their case.

Pseudo-paralysis, Syphilitic.—Aberwark[3] has studied 12 cases, which occurred among 236 children with hereditary syphilis, or in 5 per cent. Seven occurred during the first eight weeks of life, 3 during the third month, 1 at fifteen weeks, and 1 at six months of age. Other symptoms of syphilis were present in every case, and antisyphilitic treatment effected a cure without leaving any trace of nervous disease. Electrical examination gave normal reactions for both muscles and nerves. Typical syphilitic pseudo-paralysis of infants consists of a specific osteochondritis, usually situated in the epiphyses of the long bones, especially the upper end of the humerus. It comes under observation in all stages of development, and runs the course of a more or less painful and complete paralysis of the extremities. Participation of the nervous system can be excluded.

Resorcin Intoxication in Infants.—Brudzinski[15] reports a fatal case in a female baby 1 month old, bottle-fed, emaciated, affected with diarrhea, for which resorcin and castor oil were given. Collapse came on, the general condition being very much worse. In the urine albumin and casts were found. Cerebral symptoms appeared, and death occurred ten days after observation began. The autopsy showed gastro-enteritis and atrophy, edema of pia mater, and some atelectasis. The blood obtained during life showed poikilocytosis, leucocytosis, and many normoblasts. The kidneys presented the lesion of acute degeneration. The author believes that the resorcin was responsible for the fatal ending of the gastro-enteritis, and that the toxic symptoms of this remedy should be more carefully considered when it is used as an intestinal antiseptic. There seems to be no general agreement as to the size of the physiologic and toxic dose.

Tuberculosis.—At the congress[16] held at Berlin in May, 1899, for the purpose of considering the prophylaxis and treatment of tuberculosis, M. Heubner says that prophylactic measures should be initiated in the earliest infancy for two reasons: the first, that the disease not infrequently ocurs in the first two years of life and is then of a special gravity; and

second, that it is very possible that the tuberculosis which oc-
curs in adults may in a number of cases trace its origin to a
tubercular infection dating back to childhood In children
tuberculosis is nearly always manifested by a contamination
of the respiratory or digestive tract.   This fact shows the im-
portance of keeping children from all contact with tuberculous
persons.   The predisposition to the disease is not the same in
all children; it is always marked in those with a tuberculous
heredity.   Hygienic measures can greatly lessen it.

M. Juba says that although the disease is not very frequent
among school children, none the less is it necessary that by a
physician's advice all tuberculous children or those suspected
of tuberculosis should be kept away from school.   The build-
ing of schools should be improved so that the destruction of
the infectious agent by light may be facilitated.

M. L. Derecq sums up his remarks as follows: 1. Children
born in crowded cities possess a weakened physical resistance,
which predisposes them to infections to which they may be
exposed.   The children of debilitated, alcoholic, tuberculous,
etc., parents have even less resistance than others.   2. The
debility of city-born and bred children is greatly increased by
the many diseases of childhood, and also by the nature of the
life they lead.   3. Because of the absence of pure air and sun-
light, the convalescence of these children from various diseases
does not lead to absolute recovery.   4. This period of conva-
lescence should be regarded as the most dangerous for the
young organisms.   The etiology of tuberculosis shows that
this time is the most favorable for infection by the bacillus.
5. Children of every social class are exposed to tuberculosis in
the cities.   The chances of infection are increased by the over-
crowding in houses and the lack of observance of hygienic
rules.   6. By strict prophylaxis in diseases of children in cities,
especially during convalescence, and by open-air treatment con-
stantly repeated, tuberculosis may be successfully combated.

It is greatly to be desired that the prophylaxis of infantile
tuberculosis should be systematically studied.   Cities should
establish hospitals and sanitaria *outside of their walls* for the
reception of convalescent poor children.   At home proper
sanitary precautions should be observed during the conva-
lescence of children.   Teachers of children should be informed
as to the terrible infant mortality caused by tuberculosis and
the proper prophylactic measures to be observed.   The pro-
phylaxis of tuberculosis should be understood by all persons
who have the care of children.

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ORIGINAL COMMUNICATIONS.

THE GONORRHEAL PUERPERIUM.[1]

BY

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IN days gone by, severe diseases which had as characteristics
high fever and a dulness of the special senses were designated
under the general head of typhoid fever; but clinicians have,
little by little, separated from the general typhoid state single
pathologic processes, such as pneumonia, meningitis, etc.,
and at the present typhoid fever is a well-defined disease.
This result was only attained by carefully recording the differ-
ent descriptions, and finally a differential diagnosis between
the various infectious diseases was made out. Then, with the
appearance of the science of bacteriology and with its rapidly
perfected technique, endeavor was made to ascertain if each
infectious disease had its own special micro-organism, which

[1] Read before the American Association of Obstetricians and Gynecolo-
gists, September 19 to 21, 1899.

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could be considered as its exclusive factor, and in many cases this result has been attained. Bacteriologists have also done their share in subdividing infectious processes that were formerly thought to be due to a single agent, as, for example, the pneumonia due to streptococci and the pneumonia due to the pneumococcus.

In much the same fashion puerperal sepsis was formerly considered as a single processus, always accompanied with a more or less high degree of temperature. The older gynecologists and obstetricians unfortunately had at their disposal a large number of these cases, with a frightfully high mortality, as compared with the present statistics since the introduction of antiseptic methods. It was not long before surgeons were able to distinguish certain forms of puerperal septicemia, and soon a number of varieties were described. Considering the entire course of this affection, a distinction was made between the acute processes which affect the entire organism, and the lighter infections which are limited, at least in the beginning, to the uterus. According to the manner in which extension of the infection took place, either by the blood vessels or the lymphatics, the processes termed septicemia and pyemia were defined, while ulcerative endocarditis and phlegmasia alba dolens were also included in this group. For the localized septic processes names were selected in accordance with the location of the infection and have been designated as puerperal vulvitis, colpitis, endometritis, parametritis, and perimetritis.

Ignaz Semmelweiss, in 1847, was the first to open up the road for the exploration of the etiology of these divisions, which, from the differential diagnostic point of view, are very distinct. Semmelweiss repudiated the theory of cosmic or telluric influences on the origin of septic puerperal processes, and upheld that for any type of puerperal infection decomposed organic matter was the true factor. He, however, admitted two manners of infection—namely, direct infection of the patient by hands or instruments, and, secondly, autoinfection. By autoinfection he inferred that a poisonous material could be elaborated in the puerperal uterus and could spontaneously originate there. As is well known, the teachings of this great man met with much adverse criticism in the beginning, and it was only after Lister had demonstrated the practice of antisepsis that his ideas became generally accepted.

Bacteriological science has done its best to supply bacteriological proofs of these clinical experiments and observations; it

has searched in vain for a single specific germ for all diseases of the puerperium, but, with all the great amount of research, it has been uniformly proved that the pus-producing organisms —namely, the streptococcus and the staphylococcus—are the factors of puerperal fever.

When Goldscheider wrote his important paper a few years ago, all severe cases of puerperal septicemia were ascribed solely to the streptococcus, and he admitted that the staphylococcus was in play only when the process was distinctly limited: Winckel sustained this teaching.

The number of bacteria producing the less severe types of puerperal septicemia is far greater, and all authorities who have clinically or bacteriologically studied the factors of puerperal infection now admit a fundamental difference between infection, the active entering of the bacteria into the living tissue; autointoxication, which is produced if bits of placenta or membrane are retained in the birth canal and there decompose: and the entrance of the toxins of these saprophytes into the general circulation. Spiegelberg was the first to point out the last condition, and Duncan named it sapremia.

The principal characteristic of sapremia is that, when the noxious cause is removed, the process is cut short if done in time. In the localized forms of puerperal sepsis the streptococcus, as well as the staphylococcus, may also be in play as in the more serious infections; and Hartmann, Morax, and many others, including the writer, have been able to demonstrate the presence of the bacterium coli commune in intraperitoneal abscesses arising during the puerperium.

Bumm has pointed out that the streptococcus, as well as the staphylococcus, is only pathogenic facultatively, and this is a well-known character of the bacterium coli. Bumm is of the opinion that the severeness of the infection is in direct relation to the condition of the soil, as well as by the degree of virulence of the pyogenic organism present; and he has asserted that there must necessarily exist a third factor, which is probably a chemical matter, which renders the tissues less resistant to the penetration of the bacteria when once they have gained access, but as yet this chemical substance has not been demonstrated. Besides the question as to when and how pyogenic bacteria become pathogenic in the puerperal state, we have also to consider the question of autoinfection.

It has often been noted that after confinement in which neither manual nor instrumental interference has been em-

ployed, the patients have run a temperature, and in order to
explain this phenomenon certain writers have again resorted
to the theory of autoinfection as emitted by Semmelweiss.
Ahlfeld has most emphatically asserted that pyogenic bacteria
might be present in the genital organs before labor, and that
when this had taken place the result would naturally be a post-
partum infection.

When this theory was emitted a very careful and minute
technique of disinfection was introduced. " Microbes are all
about" was the cry, and in the heat of the struggle against
bacteria it was entirely forgotten that a normal labor was a
physiological process, whose termination, if left untouched,
would in all probability result in the rapid recovery of the pa-
tient. It is certainly very droll when we recollect that only
thirty years ago the fanatics on antisepsis went so far as to de-
mand the draining of the puerperal uterus in order to prevent
the lochia from becoming infected; but very soon statistics
showed that with all this complicated technique no decline in
the mortality of labor cases occurred, and consequently at the
present time the exaggerated processes of disinfection in nor-
mal labor have been practically abandoned.

The technique of cultures has so greatly been perfected in the
last few years that the question of autoinfection has been
pretty thoroughly studied with the aid of bacteriology.   Dö-
derlein, Krönig, Stroganoff, Menge, Winter, and many others
have examined the secretions of the genital tract during preg-
nancy, labor, and the puerperium, from the vulva to the endo-
metrium, but their results are as yet most contradictory on a
great many points. The only fact that seems to be pretty
clearly established is that from the internal os uteri upward
the genital organs are free from bacteria, while micro-organisms
are frequently present in the lower parts, a number of them
being, however, a certain type of long bacilli producing an acid
reaction of the discharges and which are harmless.

The theory of autoinfection, which at present is neither en-
tirely abandoned nor thoroughly believed in, has certainly
enriched the etiology of puerperal fever, inasmuch as in certain
cases of cryptogenic affections arising during the puerperium
it became evident that other influences which are in no way
connected with the confinement may be the means of a compli-
cation during the puerperium, and that under certain circum-
stances certain ones of the acute infectious diseases will produce
pyrexia during the puerperium; but if a subject is attacked by

one of these infectious diseases we cannot correctly say that we are dealing with a puerperal fever, but, more correctly, *a fever during the puerperium.*

One of the earliest infections described as a complication of the puerperium was erysipelas, but it is as yet doubtful whether or not the two types of streptococci, namely, the streptococcus pyogenes aureus and the streptococcus erysipelatis of Fehleisen, are identical. Winckel believes in the identity of the two forms, while Gusserow believes that they are related to each other but differ in their effects. Olshausen was one of the first to call attention to the relationship between scarlet fever and puerperal septicemia. Ballantyne has described a case of hematoma of the broad ligament produced by scarlatina infection, while Werth found Eberth's bacillus in an abscess of the ovary. The influence of measles on the puerperium has been well described by both Klotz and Ballantyne. The latter has reported a case of premature labor where the patient showed many spots of the characteristic eruption of measles. Bumm has found Löffler's bacilli in the endometrium, while Ripperger has demonstrated that influenza may disturb most seriously the normal course of the puerperium. Massen has conclusively proved that all infectious diseases show their presence in the genital organs of a female in the form of an interstitial hemorrhagic endometritis, and in 1895, in a series of clinical lectures on "Metritis as the Cause of Miscarriage," the writer has fully gone over the ground of this subject.

Of all the acute infectious diseases, it is certainly gonorrhea which plays the most important part in the complications arising during the puerperium. Owing to the fact that the acute stage of this affection is not of long standing in the male, and that gonorrhea seldom extends beyond the posterior urethra, and that the appearance of gonorrheal metastases, generally speaking, is by no means of frequent occurrence, and up to a short time ago gonorrheal infection in the male was considered cured when the subjective symptoms had disappeared, it is not to be wondered at that only a very few years ago the disease, when occurring in the female, was considered as a mild affection localized in the vagina.

It is perfectly natural that Noeggerath, for purely clinical reasons, became convinced that the sexual life of woman could be most fatally interfered with if gonorrheal infection took place, and in the beginning he found but very few believers in the proofs which he adduced to uphold this theory; but at the

present time his original writings form the basis of recent researches on chronic gonorrhea of the female. Noeggerath not only emphasized the extremely frequent occurrence of chronic gonorrhea in the male, which he estimated to amount to 80 per cent of the male population in large cities; he asserted that 90 per cent of cases of chronic gonorrhea were never cured, and that the gonococci present without producing symptoms were present in a latent form, as he expressed it, and as such were capable of infecting the female. The consequence was that of 100 women whose husbands had had gonorrhea at some time in their bachelor life, there were scarcely 10 that were well, and one might assume also of that tenth part that at some time or other gonorrhea would be contracted. Basing his assertions on 50 cases, Noeggerath considers perimetritis as the most frequent and the most severe consequence of chronic gonorrhea.

According to its occurrence he divided perimetritis into four types, namely: (a) the acute, (b) the recurrent, (c) the chronic perimetritis, and (d) ovaritis. According to this observer perimetritis most frequently arises at about the third week post partum, while the greatest amount of damage inflicted by this process was complete sterility in more than 50 per cent of cases.

Fritsch was the first who undertook to refute some of Noeggerath's assertions, and he chiefly was opposed to the theory of "latency" as put forth by Noeggerath, inasmuch as "an affection of the body is something actual and does not cling like a curse to the organism." Noeggerath's second assertion—namely, that gonorrhea always attacks the entire genital tract—Fritsch tried to refute by citing some of his clinical experiments; in one of his cases, however, in which a perimetritis occurred after miscarriage, the etiological factor of which could only be considered as the gonococcus, the patient recovered after a protracted illness. He nevertheless asserts that gonorrheal perimetritis is far from being as frequent as Noeggerath would have it.

About ten years later Fritsch again disputed the correctness of Noeggerath's theories regarding sterility following gonorrhea. Winckel and Olshausen both stated their conviction that gonorrhea is a much more serious affection than was formerly assumed, but at the same time they insist that the theories regarding sterility are exaggerated, and Winckel expressed himself by saying that if Noeggerath's theory held good to its full

extent, mankind would be on the road to destruction.   Schröder agrees entirely with Noeggerath in his treatise written in 1887, although at the beginning he was inclined to contradict the former's opinion.   He only deviated from his views in the part relating to the frequency of the infection, and Noeggerath himself considerably reduced his percentage later on.   The most decided adherent to Noeggerath was Sänger, and in a paper published some years ago this authority stated that one-ninth of all diseases of the female genital organs was due to gonorrhea.   Fifty per cent of these patients presented lesions of the tubes and peritoneum which had resulted from an ascending infection during the puerperium, and from this he concluded that almost all suppurative lesions of the adnexa are chiefly gonorrheal in nature.   According to Schwartz the percentage of gynecological cases afflicted with gonorrhea may be put at 12.4 per cent, his diagnosis being partly clinical and partly by smear cultures.   He examined 617 females, 112 of whom presented gonorrhea, and, like Sänger, he points out the frequency with which the tubes become involved from an ascending infection, and predicts that in the future many cases of ovarian abscess, pelvic peritonitis, and generalized peritonitis will prove to be due to the gonococcus.

Some time later Sänger made the statement before the first Congress of German Gynecologists that one-eighth of gynecological affections were of a gonorrheal nature; and in order to get a correct idea of how often complications during the puerperium are due to gonorrhea, he examined the gynecological records of the Leipzig clinic and found that 26 per cent of the pregnant women were affected with this pathologic process.   In order to corroborate this statement he referred to Oppenheimer, who a year previously had studied the cases in the gynecological clinic of Heidelberg, and who had found that 27 per cent of the pregnant women there admitted were afflicted with gonorrhea and that 40 per cent of the children born in the institution presented a gonorrheal ophthalmia.   That this latter affection could never be produced by normal lochia has been demonstrated by Zweifel, who inoculated the conjunctiva with healthy lochial discharges and always with a negative result.   Lomer, who at that time was connected with Schröder's clinic, had also made researches for the gonococcus in 32 pregnant women and found the organism present in 9 of them, or, in other words, 28 per cent.

It must be stated that Sänger made his diagnosis from a

purely clinical standpoint, as he did not consider bacteriological examinations reliable, and he also pointed out the importance of gonorrheal ophthalmia as a diagnostic point of gonorrhea in women recently confined.

From these figures it at once becomes evident that more than twenty-five per cent of pregnant women are afflicted with gonorrhea, while at the same time the mortality during the puerperium is comparatively small, and Sänger concluded that gonorrheal infection complicating the puerperium can occur in the two following manners, namely: (1) to an existing gonorrhea there is added a septic infection, which he terms a puerperal-gonorrheal mixed infection; (2) gonorrheal infection which ascends during the puerperium, in which case the disease is due entirely to the gonococcus. This simple infection may have produced an endometritis during pregnancy without having interfered with its progress, and the proof for this assertion he bases on a case reported by Donat, where a miscarriage took place only at the eighth month, although there were numerous small foci of suppuration present in the maternal and fetal choria.

Clinically, Sänger divides puerperal gonorrhea into a process developing *soon after* labor, and, secondly, a process developing at a *later period of the puerperium*, and he gives an example of each. The early infection occurred in a primipara who contracted an acute gonorrhea from her husband nine days after labor had taken place. Three days after coitus she developed a pelviperitonitis, from which she recovered at the end of twenty-two weeks. The example of a late gonorrheal infection was demonstrated in the case of a patient who had given birth to her sixth child; during the third week of the puerperium she developed peritoneal symptoms, which, however, were milder in their manifestations than those met with in a true septic peritonitis. Examination showed a deep laceration of the cervix and a parametritic exudate; the right adnexa had been affected ever since the first labor. On account of the pain present, Sänger removed the diseased structures later on and found that the left tube and ovary were normal, while the right tube had been transformed into a pyosalpinx of fairly good size. This patient's husband was affected with both gonorrhea and stricture. Sänger doubts whether gonorrhea shows itself so early frequently, and thinks that the acute peritoneal stage of the affection usually begins during the second or third week of the puerperium, or even later. In both

cases the inflammatory process extended beyond the tubes to the peritoneum; in the case of the early infection a fresh inoculation of the gonococcus was necessary, while when the disease shows itself at a later period Sänger believes that it arises spontaneously from a gonorrheal focus previously present. He states that the extreme tenacity of the gonococcus is very evident from the simple fact that it persists long after the puerperium, although a large number of various organisms that are present in the genital canal die off, but Neisser's organism persists, in spite of the elimination of the endometrium, without being destroyed or being expelled. When the regenerated mucosa has developed, it will grow more luxuriantly on it than before.

Graefe has recorded another instance of early infection which very closely resembles the example reported by Sänger. A woman who had been infected two days before her labor by her husband, who had an acute gonorrhea, became ill twelve hours after labor with symptoms of severe septic infection. The condition then changed in a most extraordinary manner: the temperature, which had attained 40°, rapidly declined, but the pulse remained small and very rapid; the patient looked as if she had an attack of cholera, but ice and opium produced a rapid recovery. On the second day after birth the child developed a gonorrheal ophthalmia.

As in the case of septic puerperal salpingitis, which may result in fatal peritonitis from a rupture of the tube and escape of pus into the peritoneal cavity, so can gonorrheal peritonitis originate from a previously existing gonorrheal infection of the tubes; and Sänger believes that a certain time is required during which gonorrheal pus can extend from the endometrium into the tubes and from there infect the peritoneum, and that in this manner we can explain the occurrence of a late infection during the puerperium. Sänger agrees with Noeggerath that gonorrheal peritonitis is always limited to the true pelvis and never becomes generalized.

Sänger's views led Kröner to examine the question. He saw the mothers of children that had been treated in the Breslau clinic for ophthalmia, obtained the history of the mothers, and made a local examination. Out of 91 women that he examined, 35 positively stated that they had had fever during their puerperium; but he, however, doubts that the trouble was caused by gonorrhea in all of them, and only admits the diagnosis of gonorrheal infection when the specific organism has

been demonstrated to exist in the genital organs. On the other hand, Sänger insists that his method of investigation was much better, and he stated that he had found 35 cases out of 230 cases of gonorrheal infection in which the disease could be traced back to the confinement itself. The return of menstruation and sexual life; the rapid spreading of the process in the regenerated endometrium, which has become more receptive; the more patent condition of the uterine orifices of the tubes, and subinvolution of the uterus, are all adduced by Sänger for the explanation of the occurrence of tardy gonorrheal infection.

The bacteriological demonstration as to the nature of the gonococcus is based upon the results of the researches of Bumm, which he published in 1895. By using human blood serum as a culture medium, Bumm was able to demonstrate various types of diplococci closely resembling Neisser's organism, both in their appearance and in staining, but which when inoculated he found were not pathogenic for the male urethra, and he termed them pseudogonococci. Neisser's organism is distinguished from the pseudo types by the fact that it actively penetrates into the protoplasm of the leucocytes and is found situated around the nucleus of the cell. By means of a pure culture Bumm was able to produce gonorrhea in a healthy urethra, and was thus able to comply with the third condition of Koch, namely, the proof of the specific action of a microorganism demonstrated by a successful inoculation of a pure culture.

From examination of sections made from the human eye, Bumm concluded that the gonococcus would neither penetrate the pavement epithelium nor the stratified pavement epithelium and much less the connective tissue, nor did it act as a factor of inflammation, and he concluded that the only surface on which it would grow were the mucous membranes, which are covered with a cylindrical epithelium. It is true that Bumm had been forced to admit that the gonococcus might set up lesions in the pavement epithelium in young people, and consequently one of the principal dogmas of his teaching became practically valueless; but nevertheless, basing his theories on his personal experiments with pure cultures of the organism, he adhered to the idea that suppuration in the connective tissue, or in any other form of epithelium excepting the cylindrical type, could not be produced by the gonococcus alone, but only by a mixed infection with either the streptococcus or the staphylococcus. Bumm and Gerheim consequently upheld that

there was no pure gonorrheal colpitis, peritonitis, arthritis, or abscess of the ovary; but, contrary to their assertions, a good many observations have been reported which demonstrate the ease with which the gonococcus may produce an inflammatory process in all types of epithelium as well as the connective tissue.

Touton and Jadassohn demonstrated this fact in the male urethra, while Fritsch showed that the connective tissue of the mucosa of the rectum could be penetrated by the gonococcus up to the muscular fibre. Dinkler proved the same fact in cases of gonorrheal conjunctivitis, while Deutschmann demonstrated the very important fact that a true gonorrheal peritonitis might and did occur; this latter lesion was especially important, because the epithelium of the peritoneum is a very similar structure to that lining the synovial capsules of the joints. Menge and Zweifel pointed out that the frequent occurrence of a former inflammatory process in the peritoneum, arising from a similar lesion in the adnexa, and where the gonococcus could be demonstrated in the pus obtained from the tubes, decidedly diminished the value of Bumm's assertion that the gonococcus could only thrive on a cylindrical epithelium. Zweifel also demonstrated the presence of the gonococcus in the pus of an ovarian abscess, and Sänger has reported similar cases.

Menge emitted the following conclusions from his researches: 1. It has been proved that the gonococcus can penetrate the pavement epithelium. 2. The gonococcus is a true pyogenic organism and can produce peritonitis. 3. The fact that the gonococcus cannot be found in a peritoneal exudate cannot be regarded as a proof that it is not the etiological factor of the process, any more than can the escape of gonorrheal pus into the abdominal cavity without any resulting inflammatory process taking place; for not only would the laparatomy be carried out antiseptically and thus avoid infection, but the pus, having remained for a long time pent up in a pyosalpinx, would have lost its virulence considerably or entirely.

More light was thrown on the bacteriological side of the question, as well as clinical experiments on gonorrhea in the female, by Wertheim, who first obtained cultures of the specific organism by direct inoculation of pus on Petri's plates. He more especially demonstrated that the gonococcus is to be distinguished from other forms of diplococci, from the fact that the organism of Neisser penetrates the protoplasm of the

pus corpuscles and is decolorized by Gram's method.   The
gonococcus can be easily grown by the plate culture method, if
human blood serum, to which agar-agar has been added, has
been used for a culture medium, and in three days a very good
culture of gonococcus will have grown.   The pure cultures
obtained by means of the plate method would give rise to a
true gonorrhea when inoculated in the urethra.   Human blood
serum is by far the best culture medium, but a growth of the
organism may be obtained on agar-agar, although it will be
poor.   The colonies on a plate culture have an irregular shape;
their color is brownish yellow.   In contrast with the staphy-
lococcus the latter have a much more homogeneous form,
and the streptococcus which very soon forms chains.   Well-
developed cultures of the gonococcus may be reinoculated on
fresh blood serum in four or five weeks and a new growth will
be obtained.   The virulence is not rapidly lost by cultures on
artificial media, and a colony which had been present six weeks
on human blood serum has proved to be perfectly virulent
when introduced into the male urethra.

In a pyosalpinx of three months' duration, in which the
abdominal ostium had become obliterated, very virulent gono-
cocci were present in a pure culture.   In this very interesting
case Wertheim was also able to demonstrate gonococci in the
submucous connective tissue of the tubes, in the pus of the
abscesses of the ovary, as well as in the subserous tissue of the
peritoneum and in the fibrinous membrane covering it.   From
this he concluded that the inflammatory process had spread in
the connective tissue of the broad ligament to the ovary, and
he also concluded therefrom that an ascending gonorrhea was
a uniform process, each one of whose stages could be produced
by the gonococcus without any mixed or secondary infection
taking place, even in those cases where the lesions were very far
advanced.   Wertheim coincides with Bumm in the opinion that
gonorrheal peritonitis forms a locally limited affection and
never produces a generalized peritonitis, as does septic puer-
peral peritonitis.   To study the effect of the gonococcus in
the connective tissue, Wertheim followed Bumm's method—
namely, to inject subcutaneously on his own person pure cul-
tures of the gonococcus—but, unlike the results obtained by
Bumm, he was able to produce an inflammatory reaction of
short duration.

In another series of experiments supplementing these re-
sults, Wertheim took up the question more especially as to

how often pus tubes are due to gonorrhea.   Out of 90 cases he found the pus was sterile in 51 instances, while in 49 cases it contained bacteria; in 25 of the 49 cases the gonococcus in pure cultures was obtained from the pus in the tubes—in other words, more than 50 per cent.

Witte spoke very decidedly in favor of the possibility and frequency of a mixed infection as a result of his researches, and, carrying these on, he found gonococci present 4 times out of 24 positive cases, once in a pure culture and 3 times in combination with other bacteria.   In 52 cases of pus tubes examined by Prochownik 26 presented the evidence of the presence of bacteria, while the gonococcus was only obtained in 2 specimens, once in a pure culture and once combined with the streptococcus.

Whether or not Wertheim was right as to his percentage of cases in which the gonococcus can be demonstrated, he is at any rate the first who showed its presence in the female genital tract by staining the secretions and cultivating it, and he has pointed out the immense part played by this organism as a factor of pyosalpinx and circumscribed peritonitis without the aid of other pyogenic bacteria.   His inoculations also permanently refuted the old belief that an infection with chronic gonorrhea could only produce a chronic gonorrhea, because he was able to obtain from long-standing discharges very virulent cultures, which, when inoculated on a healthy urethra, would give rise to an acute process; and this also definitely settled the question of Noeggerath's latent gonorrhea, which is nothing else but a latent lesion containing virulent gonococci.   All this also went far in demonstrating the true pathology of puerperal gonorrhea.

Oppenheim was fully aware that the specific organism could be found in very large numbers in the lochia of females affected with gonorrhea, and that this liquid was a very excellent culture medium.   Sänger and Lomer came to the same conclusion, while Bumm found large quantities of gonococci in the lochia from the second to the fifth day and after, either contained within the leucocytes or in clusters between them. The gonococci found were very large, which caused Bumm to believe that the puerperal process was extremely favorable for the development and growth of Neisser's organism.   At this period the lochia contained hardly any other organism; in fact any other types were entirely lacking.   The process and evolution of the lochial secretion varies, but not infrequently the

secretion stops about the end of the third week of the puerperium and is only present in the form of a slight mucous discharge, and it is just at this period that the presence of the gonococcus is difficult to demonstrate.

Von Steinbüchel undertook a series of experiments at Chrobak's clinic in order to examine the views of Noeggerath and Sänger. He, in the first place, ascertained the number of pregnant women who were suffering from gonorrhea by carefully going into the history of the cases and by bacteriologically confirming his examinations, and at the same time he made the same observation that Bumm had made previously, namely, that the secretion of pregnant women suffering from gonorrhea did not differ microscopically from that of other pregnant women, either in quantity or quality. He examined 318 women, 70 of whom were affected with gonorrhea—in other words, 21 per cent. Bacteriologically, proof of the presence of gonorrhea was only absolutely positive in 22 out of the 70 cases. As a clinical proof of the presence of this affection, Von Steinbüchel points out that condylomata, cervical catarrh without erosions, and granular colpitis are symptomatic; Sänger's assertion that these three affections are pathognomonic has long since been disproved. It is a well-known fact that condylomata acuminata may also be due to other causes, as for example a considerable moisture of the parts, and it is of frequent occurrence to meet with a granular colpitis in women who are not pregnant. As far as cervical endometritis is concerned, it may simply be said that pus from a gonorrheal process will destroy the mucosa of the cervix just like any other form of pus. If we consider these sources of possible error, the statistics offered by Von Steinbüchel must be considered as representing too great a per cent, but nevertheless the number of pregnant women affected with gonorrhea is still extremely high. He considers with Fehling that a normal puerperium is one in which during the first week the temperature does not rise above 38° C.

Out of 68 cases of gonorrhea (excluding accidental causes, such as tuberculosis, erysipelas, pneumonia, constipation, etc.), 7 presented fever in the early part of the puerperium, in 4 it was present for more than one day, while in 3 it was only present twenty-four hours. Out of 242 patients who had been delivered and who were free from gonorrhea, 21 had a rise of temperature without any accidental cause being present. Comparing the 9.3 per cent of gonorrheal fever with the 9 per

cent of puerperal fever due to other sources, the above-mentioned author believes that he is entitled to conclude that the influence of gonorrheal infection on the early stages of the puerperium is practically *nil;* but, on the other hand, he confirms the opinion of Sänger and Bumm, namely, that in the late stages of the puerperium gonorrheal symptoms are very frequent. He ascertained the ultimate condition of 8 pregnant women who presented gonorrhea before their confinement, and found that 6 of them were taken ill, from two to three months after their labor, with perimetritis. One of the patients presented the first attack of peritonitis as early as the twelfth day post partum; she was a prostitute in whom an abortion had taken place during the fourth month of gestation, and during the puerperium large numbers of gonococci were present in the secretion from the urethra, but there were very few present in the lochia. The patient was dismissed on the eighth day. Twelve days after the confinement, presumably on account of too much effort in walking, she was taken with intense pain in both hypogastric regions, fever and pain in the abdomen when pressure was used. The diagnosis at that time was peritonitis, and after remaining in bed a fortnight she recovered and since has remained perfectly well. Examination five months after labor revealed nothing abnormal in the right adnexa other than a few perimetritic adhesions extending to the pelvic wall and which bound down the tube and ovary quite firmly. The left tube had grown adherent to the ovary and was embedded in a mass of perimetritic exudate, so that they formed an immovable tumor the size of a large walnut. Von Steinbüchel concludes that the late appearance of gonorrhea during the puerperium may be attributed to the distance which the gonococcus must travel to reach from the internal os to the uterine opening of the tube, and also to the fact that the lochia have a tendency to wash away the organisms, thus rendering their ascension difficult ; but when the lochia decrease in amount this source of hindrance to reaching the tube is done away with.

The conclusions of Von Steinbüchel are contradicted by Krönig as far as they concern the early part of the puerperium. This latter observer was able to find the gonoccocus in 9 women who had been delivered and who were suspected of having gonorrhea, the lochia having been obtained from the uterus by means of sterilized glass tubes. It is only by this method that it is possible to obtain lochia from the upper genital tract that have not become mixed with the secretion from the

lower part of the tract. Krönig made cultures according to
Wertheim's technique and was able to obtain pure cultures of
the gonococcus, and he also demonstrated their frequent occur-
rence in the lochia, which microscopically showed that almost
every cell contained the organism. Only 1 of these 9 patients
was free from fever, while all the others showed an elevation
in the temperature varying between 38.5° C. and 40° C. In all
these cases the fever subsided without any treatment, and there
was no other etiological factor to account for the elevation of
the temperature, and two of the patients had been delivered
without a single digital examination. In all of these cases the
lochia were greatly increased, but did not have any odor. In
six of the patients the temperature remained normal after the
end of the first week, but the lochia, nevertheless, continued
very profuse. In two instances the symptoms continued into
the latter part of the puerperium; one patient presented a pel-
viperitonitic exudate in the third week, while the other devel-
oped a parametritic exudate the size of a hen's egg, which was
complicated by a tenosynovitis of the right hand. The pus ob-
tained from the sheath of the tendons gave a negative bacteri-
ological result.

Krönig concludes that gonorrheal endometritis is in itself
quite sufficient to produce a rise in temperature during the
early part of the puerperium, and that later on the gonorrheal
process may extend upward and produce perimetritic lesions.
Whether or not the parametritis occurring in the latter part of
the puerperium is due to a secondary infection he is unable to
say, but he inclines to the opinion that it is not.

In the discussion following the reading of this paper,
Schmorl upheld that cases of infection occurring during the
latter part of the puerperium are due to a secondary infection
from the streptococcus or the staphylococcus, and he cited
three cases of a generalized pyemia following acute gonorrhea,
and in all three the pus obtained from the metastases contained
only the streptococcus. Sänger and Döderlein are also in
favor of a mixed infection with pyogenic bacteria in those cases
where pyemic symptoms arise after the presence of gonorrhea
has been ascertained.

Another case of a rise in temperature during the early part
of the puerperium is reported by Von Franqué; the temperature
rose on the third day and lasted for three days. Microscopi-
cally, gonococci were found in the secretions, and also some
short rods which could not be grown on any media. The child

of this patient presented a gonorrheal ophthalmia on the fifth day. Out of 32 cases of pregnant women who presented a pathological condition of the vaginal secretions, Burkhardt was able to demonstrate the presence of the gonococci in 19. Leopold relates as similar cases two instances of infection during the early part of the puerperium where the rise in temperature took place on the fourth day. The first case was that of a primipara, 16 years of age, who had a rise in temperature for three days. On the seventh day post partum a greenish-gray membrane was found covering the vaginal walls and the cervix, which was slightly lacerated. This membrane was examined microscopically, with the result that the gonococcus was found in a pure state. The patient was completely cured at the end of eight days. The second case was that of a female who had given birth to her fourth child and who was admitted to the hospital with a very severe cold. The child presented a gonorrheal ophthalmia two days after birth. On the fourth day of the puerperium the patient became feverish and a greenish-gray exudate was found covering the vagina and cervix. Bacteriological examination of this exudate demonstrated the presence of the gonococcus, staphylococcus, and streptococcus. In this patient the fever remained somewhat longer than in the first case, and the lochia were still in rather large quantities fourteen days after the patient was discharged from the hospital. Concerning this latter case Leopold is of the opinion that the fever was due to a secondary infection of the gonorrheal process from the streptococcus, and as the patient during her confinement had only been examined externally this would seem to be a fair example of autoinfection.

Krönig was able to demonstrate the presence of the gonococcus in 6 out of 11 patients having a pathologic secretion from the vagina, and 1 of the patients was taken with symptoms of endometritis as early as the second day post partum. Veit in his writings only alludes to the influence of very recent gonorrheal infection on the process of generation. He relates 5 cases which resemble one another, inasmuch as the infection was caused by an acute gonorrhea in the husband, the wife being infected just before or shortly after labor. In 4 cases the children presented a gonorrheal ophthalmia, and all 5 of the patients presented symptoms of acute peritonitis at about the end of the early part of the puerperium, the peritonitis combining all the classical characteristics of an acute septic type of the disease—namely, severe tympanites and vomiting,

small and frequent pulse, a temperature above 39° C., and intense abdominal pain. The appearance at a later period he considers as one of the most important differential symptoms of gonorrheal peritonitis. In all of his cases the violent symptoms diminished and the patients recovered slowly.

According to Veit the rapid ascension of the affection is due to the relaxed condition of the genital tract shortly before and during the puerperium. In all publications which have appeared, it seems to indicate that the gonorrheal infection, whose presence has been proved by the demonstrations of the specific organism in the lochia, can produce lesions either during the early or the late stage of the puerperium. A definite time cannot be fixed regarding the power of the gonococcus of producing an endometritis of a lighter grade during the early part of the puerperium, and Krönig reports cases in which the gonorrheal fever appeared as early as the second day post partum, and in his case, as well as the one reported by Von Franqué, there is nothing in the history that would tend to show that an impure coitus had taken place shortly before or after labor. The process in these cases is to be explained as the upward extension into the endometrium of a pre-existing gonorrheal infection, the process in the endometrium being accompanied by pyrexia of short duration.

In contrast to what has been said we have the reports of Sänger and Veit, which have in common the fact that shortly before or after birth an infection, with a more or less acute gonorrhea, is the factor of the affection; just how far the part played by the virus of the gonococcus is concerned cannot be definitely ascertained. Wertheim believes that in all cases a gonorrheal process is capable of producing acute manifestations in the subject infected. The symptoms of such forms of the disease probably arise somewhat later—that is to say, only toward the end of the early part of the puerperium—but they then cause very severe peritoneal symptoms, because the gonorrheal process has extended beyond the uterine end of the tube. In contrast to septic puerperal peritonitis, the fever, as well as the severity of the symptoms, soon decreases and the patient recovers in the gonorrheal type. In both forms, which are consequently different from each other, gonorrheal infection extended beyond the internal os before it influenced the temperature. It is difficult to say how the gonococcus could extend upward during the first few days when the lochia are excreted in such large quantities.

When the endometritis is followed by a parametritis with metastases into the tendinum vaginæ, Krönig does not admit that these secondary complications are due to an infection by the streptococcus, and he consequently entirely agrees with Wertheim that the gonococcus does not merely produce a localized infectious process in the endometrium, but that it also penetrates deeply into the connective tissue and can then produce a suppurative process. He thinks that the other cases of parametritis may be explained in a similar way if it be admitted that the gonococcus finds its way into the subperitoneal connective tissue through a laceration in the cervix. Continuing this line of thought, it might also be assumed that a pyosalpinx could be produced by an invasion of the gonococcus, having its starting point in the subserous membrane of the tubes and extending through their walls into their lumen, and that, therefore, the endometrium may not be the seat of any gonorrheal infection during the formation of a pus tube. This theory has generally been admitted as correct since Wertheim's first writings.

Wertheim's conclusions have, however, been considerably modified by Bumm, who admits that the gonococcus grows on all types of epithelium, and this organism is quite capable of producing either a vaginitis or a peritonitis. Gonococci have also been found in the connective tissue, but Bumm has only found them in the superficial subepithelial strata, and in the various glands connected with the genital apparatus he was only able to find them in the ducts and never in the deeper secreting portions. This result is quite sufficient to explain the pathology of gonorrheal metastases. Wertheim has demonstrated in a case of gonorrheal cystitis a capillary vessel in the superficial submucous tissue in close proximity to the mucous membrane of the bladder, that was completely filled with gonococci.

The first attempt at inoculating pure cultures of the gonococcus into the connective tissue of the arm gave a negative result, but, as has been stated, Wertheim obtained inflammatory symptoms by these inoculations, while Bumm, carrying on this line of experiments, obtained only negative results; Steinschneider and Richter also obtained negative results.

Wertheim's statement, which is most important from a clinical standpoint, that he had seen the gonococcus produce oöphoritis, salpingitis, and peritonitis after it had passed through the connective tissue of the broad ligament, just as

occurs in the case of the ordinary pyogenic bacteria, is absolutely denied by Bumm, and he declares that this statement is not supported by the results of any other bacteriologists, including Charrier. On the contrary, Bumm assumes that in this case a pyosalpinx was present and that the process had extended into the parametrium, and he declares that it is absolutely wrong to uphold that Neisser's organism can produce suppurative processes in the deep connective tissue. He asserts that gonorrheal parametritis is due to a mixed infection; and in a mixed infection with the gonococcus he distinguishes two types—namely, a secondary infection from the staphylococcus or the streptococcus developing after the first manifestations of a purely gonorrheal process; and, secondly, a symbiosis where both kinds of bacteria act at the same time. On the other hand, he admits with Wertheim that a pyosalpinx very frequently has a purely gonorrheal origin, and that the infection may in most cases be traced back to the latter part of the puerperium; and he says that the division of pyosalpinx into a septic puerperal form and a gonorrheal form is no longer sufficient, and it is also necessary to admit a gonorrheal puerperal origin.

In the case of a pyosalpinx which has produced a closing of the abdominal ostium of the tube, an acute or a recurrent perimetritis may be explained, because not only can the encapsulated pus, which is a foreign body, produce irritative symptoms, but, owing to sudden or forced movements, a thin adhesion may be ruptured and allow the pus to escape directly into the peritoneal cavity, after which the rent in the adhesion may become closed. The gonococcus can only set up a suppurative inflammation of the ovary if the pus becomes inoculated on a ruptured Graafian follicle. Bumm also upholds that this form of peritonitis never becomes generalized and never is fatal, and according to him the favorable outcome of these cases is due to the fact that the gonococcus does not find a suitable culture medium on the peritoneum and consequently leads a short life. The limitation of the peritoneal inflammation is due to the fact that the fibrinous agglutination walls off the process and prevents the extension of the gonococcus to the rest of the abdomen. The material which forms the fibrinous substance, which is termed fibrigenous matter, is contained in the inflammatory exudate, and the fibroplastic substance with its ferment is abundantly supplied by the leucocytes.

Now, while the staphylococcus and the streptococcus do not

actively enter within the leucocytes, the gonococcus, contrary
to the teachings of Metschnikoff, is able to do so very consider-
ably, and consequently is able to liberate the fibrin ferment.
It is for this reason that numerous adhesions are found in
gonorrheal peritonitis and are thrown out with extreme rapid-
ity, while in septic peritonitis due to ordinary pyogenic organ-
isms an abundant exudate is found covering all the viscera.

It may consequently be said that a gonorrheal process may
extend upward from the internal os and invade the entire geni-
tal tract.   Regarding the symptoms, all authorities appear to
agree that their course is in every case much milder than in the
ordinary septic infection, and the highest degree of a gonor-
rheal process is represented in a circumscribed peritonitis.

From a careful perusal of a large amount of literature pub-
lished on the subject in French, German, and English, one
thing stands out plainly, and that is that no definite sympto-
matology or manifestation of a gonorrheal process during the
puerperium can be described.   Gonorrhea does not appear to
produce an elevation of the temperature if the process does not
extend above the internal os; and Schauta even goes so far as
to assert that a gonorrheal catarrh of the cervix may extend to
the endometrium without giving rise to any serious symptoms,
and Fritsch's paper, which I have already mentioned, certainly
points to the correctness of this assertion.   In some of the cases
recorded in this memoir an endometritis went through its
evolution without any elevation of temperature, and an exten-
sion of the process from the uterine mucosa to the peritoneum
took place insensibly.   If a rise in temperature should occur
in a case of a pure gonorrheal endometritis, Leopold upholds
that it may take place as early as the third day of the puer-
perium, and therefore we can no longer maintain that a rise
of temperature occurring late in the puerperium is a special
characteristic of a gonorrheal infection.   The acuteness of
the progress of the affection in the early puerperium—that is
to say, the duration of fever during a gonorrheal endometritis,
with or without extension of the process to the tubes or the
peritoneum—will in all probability depend upon the virulence
of the gonococcus, whether there be a mixed infection or not.

If a newly-married girl infected with an acute gonorrhea
from her husband can show a bilateral pyosalpinx at the end
of a week—and such cases are of daily occurrence—there is no
doubt that a similar process can develop with the same rapidity
during the puerperium.   Gonorrheal processes occurring late

in the puerperium may also be traced to various causes which certainly have a preponderant influence upon the degree and duration of the process. Veit and Winter ascribe the upward extension of the infection to the uterus, tubes, and peritoneum, to the relaxation of the genital organs, or to the return of the menstrual process. Wertheim has expressed a view to the effect that in married people a certain adaptation to the gonococcus takes place, but when sexual intercourse is interrupted the immunity to the organism ceases, and the effect of coitus, when resumed, is a fresh infection.

As far as we can ascertain, all authorities agree that gonorrheal infection during the puerperium runs a milder course than other septic processes arising during the lying-in period. The milder course of the symptoms and their rapid subsidence in puerperal gonorrhea by no means indicate that the process has been cured, and it is a well-established fact that the gonorrheal puerperium is extremely chronic and defies treatment, just as is the case with gonorrheal processes in the female in general. This is especially true of recurrent perimetritis as described by Noeggerath. When the process has involved the adnexa the patient is subject to most severe suffering, and a cure can only be brought about by the removal of the appendages; and in those cases in which the affection is allowed to go on unaided by surgical interference the patient usually succumbs to a gonorrheal cachexia.

As has already been pointed out, the presence of the gonococcus can usually be demonstrated by an examination of the lochia. The organism produces such varied manifestations in all periods of the puerperium that purely clinical symptoms are not sufficient upon which to base a diagnosis, and it is of absolute necessity to examine the secretions bacteriologically in all cases where gonorrhea is suspected. The tendency of a gonorrheal process to extend upward during the puerperium, and also its persistency to take a chronic course, demonstrate that this disease has a decided influence on fecundation as well as on pregnancy. Acute gonorrhea in the female is in most cases largely limited to the cervix and urethra, and it would seem probable that an acute gonorrheal inflammation of the cervical canal would prevent the male elements from reaching the ovum either within the uterine cavity or in the tube.

On the other hand, a chronic gonorrheal process of the cervix should not interfere with the entrance of the spermatozoa

within the uterine cavity, because the cervical secretions are very scant. If the entire extent of cylindrical epithelium of the endometrium be invaded extensively by the gonococcus, the possibility of an impregnated ovum becoming attached to the uterine mucosa is very improbable. When the endometritis has assumed a chronic form, in which case the cylindrical epithelium of the endometrium has become regenerated so that only in a few spots pavement epithelium invaded by the gonococcus has remained, pregnancy can take place and go to term, or at least to the seventh or eighth month. If, on the other hand, a gonorrheal endometritis be followed by a metritis, with hypertrophy of the connective tissue and an abnormal development of the uterine glands at the expense of the muscular structure of the uterus, the insufficient elasticity of the uterus will mechanically act against the development of the organ when pregnancy takes place, and the result will naturally be an early miscarriage. This applies to the process whether it originates in the parenchyma of the uterus itself or whether it is due to the gonococcus present in the submucosa.

The most common condition met with is probably that conception and gonorrheal infection are simultaneous or take place shortly after one another, so that the development of the ovum will prevent the upward extension of the gonococcus, and it is only after labor has taken place that the uterine cavity becomes infected.

A pyosalpinx, if present in only one tube, will not interfere with pregnancy, because ovulation will take place on the opposite side and the ovum can reach the uterus through the healthy tube, and this condition is certainly frequently met with in practice. Bilateral pyosalpinx will render the female sterile, but even in cases where both tubes are patent a perimetritis with adhesions will prevent the entrance of the spermatozoa into the uterine cavity, because the uterus is bound down and its position changed in the vast majority of cases. In our opinion, and the same has been upheld by Bumm, the chronic gonorrheal endometritis and salpingitis is an important etiological factor of tubal pregnancy.

The social danger of gonorrhea is its tendency to cause sterility, and Sänger has very ably demonstrated the frequency of what he terms a " one-child sterility " as a consequence of gonorrheal infection. The first pregnancy goes to term, and during or after the puerperium the process extends upward

producing chronic pathological changes from the internal os upward, and the female thereby loses her aptness of conceiving and carrying her pregnancy to term.

On the other hand, every sterile union must not be attributed to the wife, and out of 205 sterile marriages Fürbringer found that 35 per cent were due to a former gonorrhea in the husband. According to the statistics made in France by Chervin, out of every 100 marriages 20 were absolutely sterile and 24 gave birth to only one child. Glünder, basing his researches on the history and partly on clinical examinations, comes to the result that in 84 sterile marriages gonorrheal infection was present 62 times, or, in other words, 77.5 per cent. If on the average 12 per cent of all marriages are sterile, 8 per cent of them must be ascribed to gonorrhea; and it seems thus proved that gonorrhea may not only interrupt pregnancy after it has taken place, but may prevent it from occurring altogether.

It is very true that a large percentage of females recover from gonorrheal infection without the slightest trace of the disease remaining, become pregnant and go to term, give life to children who soon after birth develop a gonorrheal ophthalmia. go through their puerperium and lactation without any trouble; while others, from the very receipt of the infection, remain sufferers for the rest of their lives, being attacked by recurrent attacks of pelviperitonitis, have abnormal labors, and often die in consequence of their diseased genital organs.

At the present time an explanation of the above statement cannot be made with certainty, but it would appear to the writer that some inherent weakness of the epithelium, as has been pointed out by Bumm, may account for those cases where the process remains. An infantile development of the female and her genital organs should also be considered as an excellent soil for the development of the gonococcus, as has been pointed out by Freund, and reddish blonde and light blonde females are certainly more severely affected by gonorrheal infection than are darker-complexioned subjects, and here the diathesis of the individual certainly acts as a *locus minoris resistentiæ*.

We will here append five cases of gonorrheal puerperium which we have seen; and although this number could probably be greatly increased, we only report these particular cases because in each instance they were demonstrated bacteriologically to be examples of the disease.

Case I.—Mrs. A. B., age 24 years, was confined of her first

child on April 21, 1895. The labor was comparatively easy and the child was an eight-pound girl. The antecedents of the patient were briefly as follows: She had always menstruated regularly without pain, the flow lasting usually five days. She was married at the age of 21. Three months after marriage the patient noticed a slight glairy discharge from the vagina, which never amounted to much of anything, excepting that it was somewhat increased during the three or four days preceding and following the menstrual epoch.

Five days after confinement the thermometer suddenly rose to 39° C., pulse 98; there were no chills. The patient also complained of considerable pain in the sacral region and also in the left side. The lochia, which had been normal in amount up to this time, decreased somewhat.

Bimanual examination revealed a small left-sided laceration of the cervix; the uterus was the size of a fetal head, soft and tender on pressure. On the left side could be felt a mass the size of a lemon, which was extremely painful and hard. Nothing could be detected in Douglas' pouch, which was perfectly free. The right adnexa were apparently normal. By the speculum a few erosions were detected on the cervix, which bled rather easily when their surface was wiped over with cotton. There were no apparent lesions of the external genitals, and the urethra seemed to be perfectly normal. An analysis of the urine was also negative. A long platinum loop was introduced into the uterine cavity, and some of the secretion was removed for bacteriological examination; coverglass preparations, stained with methylene violet, revealed large numbers of gonococci both between and inside of the epithelial cells. A diagnosis of puerperal gonorrheal endometritis and salpingitis was made. The treatment consisted of intrauterine irrigations twice daily of a 1 : 3000 solution of permanganate of potassium and application of equal parts of mercurial and belladonna ointment to the abdomen.

The temperature fell to normal just one week after commencing this treatment, which was carried out for about four weeks, at the end of which time a bimanual examination showed that perfect involution of the uterus had taken place and that the salpingitis had almost entirely disappeared. Microscopical examination of the secretion from the cervix, taken three weeks after all treatment had been stopped, was entirely negative.

The child never presented any signs of inflammation of the

eyes. The husband admitted that he had been a sufferer from gleet for the past nine years, his last attack of gonorrhea having taken place nearly seven years before marriage.

CASE II.—Mrs. A. C., age 31 years, seen in consultation with Dr. S. H. Littlefield. The patient had given birth to two healthy children, who were both alive and in excellent health. Seventeen days after the delivery of her third child, the labor being in every way normal, the patient complained of chills in the afternoon, and in the evening the temperature was found to be 38.7° C., pulse 102, and we were asked to see the patient. She was a well-developed brunette with a negative history. Examination of the thorax was negative. A few enlarged inguinal glands could be detected on the right side. External genitals, urethra, and Bartholin's glands were normal. Bimanual examination revealed her uterus about the size of a second month's pregnancy, which was soft and rather tender on pressure. There were a few erosions on the cervix, and a very little muco-purulent discharge came from the os. A platinum needle was introduced into the cervical canal and some of the secretion was removed for examination; a cover-glass preparation stained with methylene blue revealed numerous leucocytes containing gonococci, with clusters of the organism between them, and a few epithelial cells were found. The adnexa appeared normal and were not tender on pressure.

A diagnosis of gonorrheal endometritis in the puerperium was made. After complete dilatation of the cervix the uterine cavity was very carefully curetted and then swabbed out with pure carbolic acid. The fever immediately fell, and in three weeks from the time of operation the patient was up and attending to her household duties. The child never gave evidences of any complication in the eyes. The husband had contracted an acute gonorrhea about a fortnight before the birth of the child; coitus had taken place about ten days after the confinement.

CASE III.—Mrs. A. D., age 35 years, was confined of her fourth child by Dr. Rideout, of Somerville, who kindly asked me to see the case in consultation. The genital history of this patient was absolutely negative, and the previous confinements had all been normal. Five days following the confinement the patient had some slight chills, and pains in the calf of the right leg. The limb began to swell rapidly, and within twenty-four hours presented all the ordinary signs of a phlegmasia alba dolens. Two days after this the right leg became painful and

rapidly developed into the same condition as its fellow. The patient complained of a great deal of tenderness throughout the lower abdomen. We saw the patient on the eighth day after the confinement, and, on account of the condition of the lower limbs, a vaginal examination was difficult to obtain. Palpation of the abdomen revealed a mass extending across the pelvis into both iliac fossæ and upward to about 15 centimetres above the pubis.

The doctor informed us that the child's eyes were very much inflamed on the second day, but by a rigid treatment with nitrate of silver they were improving. The usual treatment of phlegmasia alba dolens was ordered.

Three days later we were asked to see the patient again, and found that the abdominal pain was becoming more severe and that the temperature was rapidly rising and on this day had reached 40° C. Ether was given, and the vagina was spread open by two vaginal retractors with much difficulty on account of the condition of the legs. There was a considerable bulging in Douglas' pouch, and bimanual examination revealed a large, diffuse, fluctuating mass behind and on the sides of the uterus. Posterior vaginal colpotomy was done, which gave issue to about 500 cubic centimetres of a thick, yellow-greenish pus which microscopically revealed a considerable number of gonococci both within and between the leucocytes.

To be brief, we will simply say that after five weeks the temperature slowly reached the normal and the phlegmasia alba dolens subsided. Bimanual examination at this time showed that the uterus was somewhat enlarged and in retroversion, bound down and surrounded by a dense mass of adhesions. About nine months later we were obliged to perform a total abdominal hysterectomy on account of the very severe pain and rectal symptoms presented by the patient.

At the time of writing fifteen months have elapsed since the hysterectomy, and the patient is in very fair health.

CASE IV.—Mrs. A. E., age 30 years, was seen in consultation with Dr. Ryan four weeks after having been confined of her second child. The antecedents of the patient, both as to her genital organs and general health, were rather obscure, although there apparently had been no symptoms of gonorrhea. The labor had been normal.

The patient was a slightly built blonde presenting a decidedly lymphatic diathesis. She complained of some pain in the lower abdomen, and for the last two days the right knee-joint

had become swollen and painful, and it was for this latter condition that our opinion was asked. Suspecting the true nature of the trouble, a bimanual examination was asked for, which revealed an enlarged and flabby uterus and considerable thickening in the parametrium. Much pain was produced by the examination. Some of the secretion coming from the cervix was removed and showed microscopically a few clusters of gonococci, which were scattered throughout the preparation.

The right knee-joint was considerably enlarged. The local temperature was elevated and the joint was extremely tender, and fluctuation could be elicited. The diagnosis of gonorrheal endometritis and parametritis in puerperio, with metastasis into the right knee-joint, was made. Irrigations of 1 : 3000 solution of permanganate of potassium were ordered to be given twice daily, and the knee was fixed on a posterior splint and a thirty per cent ichthyol ointment was ordered to be freely applied to the joint once daily. Internally fifteen drops of the oil of wintergreen were given four times a day.

The general condition improved under this treatment, and the temperature, which on the day the patient was first seen by the writer was 39.2° C., fell at the end of a week to normal. By the use of the intrauterine irrigations the genital organs were greatly improved, so that eight months after the confinement, when the patient was last seen, a general thickening of the parametrium and a retroverted uterus was all that remained ; and except for the rectal symptoms produced by this condition of affairs, as well as some pain at the time of menstruation, the patient was feeling fairly well. The knee-joint was somewhat stiff and presented a certain amount of thickening around the joint, but fairly good movements could be obtained, and the patient was able to walk without much trouble.

The patient's husband was a travelling man, and during his absence from town his wife had sexual relations with a cousin about three weeks before delivery took place.

CASE V.—Mrs. A. F., age 27 years, was delivered of her first child on February 17, 1897. Two weeks after her confinement the patient felt chilly and the temperature suddenly rose to 39° C. The labor had been a tedious one, but instrumental interference had not been necessary. As we only saw this patient once in consultation, we unfortunately do not know the ultimate outcome, but the following local conditions were found. The vagina was lined by a thin, greenish-yellow mem-

brane, which extended up on to the posterior lip of the cervix. The urethra and Bartholin's glands were normal. There were no enlarged glands in the inguinal region. Bimanual examination revealed a somewhat enlarged and tender uterus, with a mass about the size of a walnut on the right side. Examination of the secretion coming from the uterus, as well as of the false membrane lining the vagina, revealed gonococci in considerable numbers. A diagnosis of gonorrheal endometritis, right-sided salpingitis, and vaginitis in puerperio was made, and intrauterine and vaginal irrigations of permanganate of potassium were advised.

The husband admitted that he was suffering from a subacute gonorrhea, which he had contracted about four months before the birth of the child, and that coitus had only taken place on one occasion about six weeks before the confinement.

871 BEACON STREET.

PREPARATION OF THE ABDOMEN FOR OPERATION.

A BACTERIOLOGICAL STUDY FROM THE GYNECOLOGICAL DEPARTMENT OF THE JOHNS HOPKINS HOSPITAL.[1]

BY

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I. THE RECOGNITION OF A CUTANEOUS FLORA.

THE normal skin, exposed as it is to contamination from the air and other sources, fairly swarms with micro-organisms. The most of these are bacteria, but budding and mould fungi have also been found present.

Mittman[2] mentions 78 different varieties of bacteria on the

[1] The following bacteriological study of the preparation of the abdomen, made by Dr. Harris, is important as touching a part of our technique in which operators exhibit wide differences, which vary all the way from a brief scrubbing in the operating room to an elaborate. painstaking procedure beginning as much as several days before the operation.

This study is presented with the hope of provoking a further discussion of such an important subject. A careful perusal will show that the investigation presented some difficulties I think. however. the method finally used by Dr. Harris for the purpose of securing uniformity in taking his cultures—that of using a thread—is decidedly best for the purpose.— H. A. KELLY.

[2] Virchow's Archives, vol. cxiii., cited by Welch, Dennis' "System of Surgery," vol. i., p. 250.

skin, of which 50 are cocci. Varying statements are made
as to the numbers and kinds of forms found, different obser-
vers giving widely different results. Both pathogenic and non-
pathogenic forms are present. One of these, the staphylococ-
cus epidermidis albus (Welch, 1891), is believed to be a normal
inhabitant of the skin. By Welch it is thought to be a variety
of the staphylococcus pyogenes albus. Ordinarily not virulent
enough to cause trouble, it may, under the influence of a lessened
tissue resistance, have its virulence raised, causing stitch
abscesses and suppuration of wounds. This organism extends
down along the hair shafts where sterilization is impossible.
Besides non-pathogenic forms, decidedly pathogenic ones may
be found. Of these the staphylococcus pyogenes aureus and
albus, streptococcus pyogenes, bacillus coli communis figure
conspicuously. Practically the same forms are found on the
hair as occur on the skin. Haegler has cultivated pyogenic
staphylococci from the hair of surgeons. Wright has demon-
strated the diphtheria bacillus on the hair of nurses. The
shaving of the patient's hair about a field of operation, the
wearing by the surgeon of a clean skull cap, thus have good
justification.

The surgeon is, then, obliged to recognize the fact that though
he may sterilize by chemical means the surface of the skin,
ridding it of many micro organisms, the skin in its entire
depth cannot be sterilized. The white skin coccus still re-
mains in the deeper parts. But, for operative purposes, the
methods now used for skin cleansing suffice to rid the integ-
ument of its dangerous forms.

The following quotation, coming from such an authority as
Welch,[1] is consoling: " With proper technique the surgeon
has, as a rule, little to fear from the bacteria of the patient's
skin as a source of infection of operative wounds."

The bacteriology of the superficial parts of the skin under
various surgical dressings has also been studied by the sur-
geons at Johns Hopkins Hospital. Under gutta-purcha pro-
tective, the moist superficial parts invariably showed the skin
coccus in cover slips and in cultures. Under gold foil, super-
ficial scrapings from 5 surgical cases healing per primam, all
showed bacterial growths. Similar scrapings made from skin
under silver foil gave no cultural growths. But if a line of
granulation tissue was present in the wound, skin cocci were
always found in this tissue, in spite of the silver foil dressing.

[1] William H. Welch: Dennis' " System of Surgery," vol. i., p. 250.

Subcutaneous silver-wire sutures upon removal are found sterile only in one-quarter of the cases studied on the surgical side.[1]

As done in the gynecological department, the following procedures are carried out in the preparation of the abdomen for operation: On the day before the operation the " ward preparation " is done. The nurse in the ward washes the skin from the ensiform process to the pubes with green soap and water, using, too, a gauze mop. With disinfected hands she then washes the area with alcohol, ether, and mercuric bichloride solution (1 : 1000). A large sterile gauze shield is then laid over the cleansed part, this being held on with tapes. A clean nightgown is then put on the patient. In the operating room, after the patient is anesthetized and on the table, the preparation is continued in two stages. The first stage is known as the " partial preparation "; it is done by an assistant, his hands not necessarily completely sterilized. The second stage is done by an assistant with clean hands. This division equalizes labor and saves time. Between the two stages the vagina is also cleansed, this being done by the same assistant who does the partial preparation. The following is the sequence, it being under three headings:

I. Partial preparation:

    (1) Remove the ward dressing.

    (2) Lather with green soap and water and shave the area thoroughly; then flush with water.

    (3) Wash with green soap and water, paying particular attention to the umbilicus and folds of skin in fleshy patients. A gauze wash-ball may be used in this washing.

    (4) Flush with ether.

    (5) Wash off with sterilized water.

II. The vaginal cleansing is then done:

    (1) Wash with soap and water, using for this purpose a wash-ball held in a pair of long forceps. First wash the external parts, then take a fresh wash-ball for the internal parts.

    (2) Flush the parts with ten per cent creolin.

[1] Joseph C. Bloodgood, verbal.

    (3) Flush with mercuric bichloride (1 : 1000) solution.

    (4) Flush with sterile water.

    (5) Catheterize the patient.

    (6) Flush with mercuric bichloride (1 : 1000) solution.

    (7) Flush with water.

III. The final preparation of the abdomen is then proceeded
        with:

    (1) Wash thoroughly with green soap and water, using
        a wash-ball.

    (2) Flush with ether.

    (3) Flush with alcohol.

    (4) Flush with mercuric bichloride (1 : 1000) solution.
        And in those cases with old scarred skins or slight
        dermatitis, potassium permanganate and oxalic
        acid are used.

    (5) Final flushing with sterile water.

This whole process is done in from ten to twelve minutes.
The cleansed area appears reddened and hemorrhage from the
subsequent skin incision is increased.

In fat patients the deep creases of overlapping skin are to be
particularly inspected for dermatitis and eczema. Such lesions
should be healed before the abdominal incision is made, since
they may harbor virulent bacteria. One fatal case is reported,
peritonitis following a superficial eczema of the part at the
time of operation, the suppuration extending from the wound
into the peritoneum.[1]

The parts surrounding the field of operation are covered with
sterile towels or by a perforated sheet, the perforation expos-
ing only a small area about the site of incision.

The above-described method of preparing the abdomen is
thoroughly in accord with the terse popular statement that
" one's mortality in abdominal surgery is governed more by
what he puts into the peritoneal cavity than by what he takes
out."

III. A BACTERIOLOGICAL STUDY OF THE CLEANSED SKIN OF THE ABDOMEN IN PREPARATION FOR OPERATION.

With the object of finding out just how successful these
previously described efforts at disinfection were, the follow-
ing bacteriological study was carried out. Bits of skin about
two millimetres square were cut from the abdomen both after

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[1] Howard A. Kelly: " Operative Gynecology," vol. ii , p. 10.

partial and after complete cleansing, and with these, cultures on
agar plates were made. These bits were first dropped into a
fifty per cent solution of ammonium sulphide, in order to over-
come the deleterious influence which the mercuric chloride solu-
tion used in preparing the abdomen might have on the cultural
growths, insoluble mercuric sulphide being thus formed. After
an exposure in the sulphide of one minute, the bits were placed
in sterile water for one minute, this being done to wash off any
excess of ammonium sulphide. With sterile forceps and scis-
sors the bits were then minced and dropped into a Petri dish
containing melted agar. For reasons to be stated later, this
method was found to be objectionable. The following results
were obtained:

Number of experiment.	Site of removed skin.	Stage of preparation.	Number of minced pieces.	Colonies af- ter forty- eight hours.
1	Abdominal wall near umbilicus.	After complete....	13	280
2	Abdominal wall just above pubes	After partial.......	9	160
3	Abdominal wall near umbilicus.	Hurried complete..	10	1000 ±
4	Abdominal wall near umbilicus. Same subject.	After partial.......	2	360
		" complete.....	5	560

These colonies were mostly of white or yellow staphylococci.
The objection to this mode of experimentation was that a com-
parison of the richness in bacteria of the skin during various
stages of the preparation was impossible, the pieces of excised
skin varying in the amount of surface they exposed to the cul-
ture medium. The mincing of the excised bits into the same
number of small pieces at each experiment required too much
time and exposure to the air. And even were these last
features consistent with the aseptic technique used, these small
bits, too, would, in the various experiments, differ in the amount
of surface they offered to the agar. In experiment 4 of this
series there is, however, a relative decrease in the number of
colonies obtained after complete sterilization, considering the
greater number of skin particles in the plate made from the
skin after complete preparation.

Similar experiments have been done in the surgical operating
rooms. The abdominal preparation on the surgical side of this
hospital differs from that done in the gynecological operating
room in only a few details. The principal difference is in the

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additional use of potassium permanganate followed by oxalic acid. In 15 cases of inguinal hernia, after complete preparation and flushing of the area with normal salt solution, bits of skin were excised from the field of operation. These were dropped into agar tubes. In every case growths of staphylococcus epidermidis albus were obtained.

The work in the gynecological department was continued, not in the above-described way, but by different methods. One experiment was done by drawing a medium-sized silk suture through the skin, passing down well into the true skin. The result was as follows:

			Number of colonies in forty-eight hours.
Experiment No.5.	After partial preparation.	Four pieces of silk, each 4 centimetres long, treated with $(NH_4)_2S$ and H_2O, dropped in melted agar.	1400
	After complete preparation. (Same subject.)	Four pieces of silk, each 4 centimetres long, treated with $(NH_4)_2S$ and H_2O, dropped in melted agar.	800

The results of experiment 5 show a lessened number of organisms after the complete cleansing, the relation to the number after partial cleansing being 4 : 7. The above experiments show, as has often been done before, that it is impossible to completely sterilize the skin.

Attention was then directed entirely to showing how far the methods of cleansing done before an operation succeeded in sterilizing the superficial layer of the skin. This is the most important part of the integument as concerns the carrying in of infected skin particles at the time of operation. Such a mode of infection might easily occur (and probably often does occur) from manipulation about the wound, the clean instruments and sterile swabs, gauze, and operator's gloves often coming in contact with the skin about the field of operation.

Relative to the bacteriological study of this cuticular layer after various stages of preparation, different methods of taking cultures from this part were considered. Superficial scrapings were first thought of, these to be dropped into agar plates. The objection here was that the same amount of scrapings could not be gotten for the different plates. A fair comparison

of the plates would then be impossible. The rubbing of pieces of sterile gauze on the skin and then making cultures from the gauze was also considered. The difficulties here were in getting for each plate the same area of gauze exposed to the skin, and furthermore in getting equal pressure on the skin in all the experiments.

The method finally adopted was as follows: A piece of medium-sized, sterilized silk suture is grasped at its ends in the two hands (not sterile) of the experimenter. An elevated fold of the abdominal skin is then made by one of the attendants grasping the skin in his two hands. The middle part of the silk suture is then drawn or sawed over this fold of skin five times. The middle portion of the thread, 7 centimetres, is then snipped off with sterile scissors, put in ammonium sulphide one minute, then gently into sterile water for one minute, then dropped into a Petri dish containing melted agar. The plate before solidifying is moved about in a horizontal direction to give thorough contact between the infected silk and all parts of the agar.

The results were better than those previously obtained. When colonies grew they were found both along the threads and dispersed about the agar. Each experiment was made on the same subject, the strings being taken at various stages in the sterilization. The following results were obtained by this "drawstring" method:

No. of experiment.	Number of colonies afterward simply cleansing.	Number of colonies after *partial* cleansing in operating room.	Number of colonies after *complete* cleansing in operating room.
6	102	40	4
7	10	5	0
8	15	9	0
9	Not taken.	40	0
10	"	3	2
11	"	4	1
12	"	3	3
13	30	Not taken.	1
14	20	"	0
15	Not taken.	"	2

The striking points of this series are: (1) The lessened growths from skin "completely" cleansed. (2) Growths occurring in most cases (60 per cent) from skin even after "complete" cleansing.

The advantages of this drawstring method are: It gives the

same-sized area (be it infected or not) to the culture media, so a comparison of subsequent growths is possible; it requires but little time and manipulation, thus lessening the danger of contamination.

From the above study the following conclusions may be drawn:

1. It is impossible to sterilize the living skin.

2. Efforts at sterilizing even the superficial parts of the skin by methods used in the operating room are unsuccessful in most cases (and probably so in all cases).

3. The degree of sterilization of the cuticular layer of the abdominal skin, achieved by preparation for abdominal section, varies directly with the amount of cleansing done.

In conclusion, the thanks of the writer are expressed to his teacher. Dr. Howard A. Kelly, under whose direction this study was done, and also to Dr. Guy L. Hunner for his repeated assistance.

THE REFLUX OF AIR INTO THE URETERS THROUGH THE AIR-DISTENDED BLADDER IN THE KNEE-BREAST POSTURE.

BY

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THE important practical question as to the possibility of a reflux of fluids from the bladder into the ureters has been raised of recent years in contradiction to the views of the older writers.

The distinguished French surgeon, J. L. Petit, who lived from 1674 to 1750, in his great surgical work posthumously published, makes a declaration with which all subsequent writers and observers have substantially agreed until recently. He states [1] that there can be no escape of urine from the bladder into the ureters, because the ureters run obliquely between the coats of the bladder; and as the latter becomes distended and the inner coat is pressed against the outer coat, the ureter is necessarily compressed between them and so a reflux is prevented. He further states that it is well known that under continued over-distension of the bladder the ureters and the renal

[1] Petit: "Traité des maladies chirurgicales, etc.," 1790, vol. iii., p. 4.

pelves also undergo great distension; but this is due, not to the back flow into the ureters, but because the urine which is se creted after the bladder has been filled, is now no longer able to enter that organ, and for this reason accumulates in the upper urinary tracts.

Lewin and Goldschmidt, in a paper published first in the *Berliner klinische Wochenschrift* (1893, vol. xxx., page 776) and later *in extenso* in *Virchow's Archives* (1893, vol. cxxxiv., page 33), called this accepted dogma into question upon the basis of a series of experiments upon rabbits, in which they found that colored fluids such as milk and methylene solutions, in the intact bladder moderately distended, with active mus cular contractile power, were taken up into the ureters as far as the renal pelves by an active antiperistaltic movement, to be again discharged downward by peristalsis.

These experiments were repeated and verified by Courtade and Guyon,[1] who showed, however, that the phenomenon was far less likely to occur in dogs, where the muscular power of the bladder was greater and exercised a more efficient control over the ureteral extremities.

As a result of these experiments, the possibility of such a reflux into the human ureters has been admitted; upon the practical results flowing from such an admission I need not dwell.   I wish here to record my own observations regarding the entrance of air into the ureters.

When the patient is put in the knee-breast position and a catheter introduced as far as the renal pelves, a little air some times enters and escapes later in bubbles with the discharge of the urine.

Sometimes, however, the air enters the ureter spontaneously before the ureteral orifice is touched, and, entering at the tem perature of the room, it shortly becomes heated within the ureter to the body temperature, when it is forced out of the ureteral orifice in the form of a little bubble.   This bubble has guided me to the position of the ureteral orifice in several in stances where it was difficult to find.

More frequently the air enters spontaneously into an inflamed ureteral orifice on a side which is discharging pus (pyuria); in these cases, when the ureteral opening is concealed in the puffy, hyperemic mucosa, the little tell-tale bubble is a wel come sign which marks the site of the hole.

I have witnessed this phenomenon not less than twelve

[1] Ann. des mal. des org. gén.-ur., Paris, vol. xii., p. 561.

times. In one instance the bubbles of air and pus which marked the ureter escaped in a continuous stream; this, however, proved to be a case of pathological pneumaturia due to the presence of a large gas-forming bacillus in the kidney.

The fact that a gas will enter the ureters simply shows that they are not air-tight under some conditions, and does not prove in any way that they are not water-tight under physiological conditions.

I have never seen any harm come from the entrance of air, and it causes the patient no pain.

THE DIAGNOSIS OF TUBERCULAR PERITONITIS.[1]

BY

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WHENEVER the abdominal surgeon is called upon to discuss his favorite field of labor, it is with the feeling that "fools rush in where angels fear to tread." From a constant study, during the past decade, of the lesions of the abdominal and pelvic cavities, and an intimate knowledge of how doubtful our diagnosis previous to operation must be, it was with many misgivings that the writer consented to comply with the request of our worthy secretary and bring before you for discussion some data relative to the diagnosis of this ofttimes obscure disease, tubercular peritonitis.

The peculiarities of the peritoneum, as described by Treves,[2] are (1) its enormous surface area, (2) its great powers of absorption, (3) its limited resistance to septic organisms and their products, (4) the rapidity with which it heals, (5) the varying degree of vulnerability in different parts, (6) its great sensitiveness.

Knowing, as we do, that tubercular infection, primary or secondary, finds its way into every portion of the body, it is not surprising that a serous membrane endowed with the above-named qualities should at times be found the seat of

[1] Read before the Eastern Medical Society, April 14, 1899.
[2] British Medical Journal, February and March, 1894.

tubercular changes and without appropriate treatment result in a high mortality.

" Peritonitis may occur in fetal life, with the production of extensive adhesions, which may interfere with the development of the intestines and result in various malformations. Silbermann ascribes these cases to syphilis." [1]

A case of apparent intrauterine peritonitis has been described by Ballantyne.[2] A child, without being manifestly ill, died thirty-two hours after a normal but somewhat prolonged labor. At the autopsy the intestines were found distended with fetid gas and fluid meconium, and there were evidences of extensive dry peritonitis of quite recent date. In the pelvis there were signs of an older inflammation, especially about the right Fallopian tube.

In the newly-born, acute pyogenic infection of the peritoneum most often takes place through the umbilicus, runs an acute course, and very often ends in death. At the Good Samaritan Dispensary, in the service of my late chief, Prof. Van Arsdale, we saw many of these cases in the early stages, before the peritonitis had become general. The treatment adopted was to apply the " balsam-oil dressing," which thoroughly drained the point of infection, and, as far as the writer knows, resulted in a cure.

Holt,[3] while admitting that there does exist a chronic nontubercular form of peritonitis with ascites, believes it to be a rare disease, and compares it in its pathological and clinical aspects to a subacute or chronic pleurisy with effusion; but by far the most frequent form of inflammation is that due to tuberculosis. Nearly all cases thus far reported have occurred in children over 6 years, and arise from causes which are obscure. Brown [4] has reported a case of tubercular peritonitis in a child 2½ years old, with miliary deposits in the lungs.

Accepting the dictum of Jacobi [5] that " anatomically and pathologically the disease is the same in children as in adults, except that in adults a large number originate from pelvic tumors," and the statistics of Krönig [6] by which he demon-

[1] Holt: " Diseases of Infancy and Childhood," p. 418.

[2] Edinburgh Medical Journal, March, 1891.

[3] Loc. cit , p. 419.

[4] Montreal Medical Journal, July, 1894

[5] Discussion on Peritonitis before the New York County Medical Society, September, 1890.

[6] British Medical Journal, August, 1890.

strates that the disease occurs almost exclusively in women
and children (out of 137 cases collected by him, only 16 had
occurred in men), we can most profitably study the disease
clinically as we have seen it in the female subject.

From a study of the 100 consecutive celiotomies which came
under my care in 1892 and 1893 while a resident of the New
York Cancer Hospital, we find that the incentive for operative
relief was due to the following diseases:

Ovarian cyst	20	Hernia, omental	2
" " multilocular	1	" ventral	3
Broad-ligament cyst	1	Floating kidney	1
Papillomatous cysts	2	Movable "	1
Dermoid cyst	1	Exploratory	1
Pregnancy, tubal	2	Tubercular peritonitis	4
" extrauterine	1	Carcinoma, uterus	6
" abdominal	1	" cervix	2
Hydrosalpinx	2	" gall bladder	7
Pyosalpinx	12	" intestines	1
Salpingo-oöphoritis	2	" sigmoid	1
" and peritonitis	3	" rectum	1
Salpingo-oöphoritis and appendi-		" stomach and liver	1
citis	2	Ulcer, stomach	1
Abscess, liver	1	Gastroptosis	3
Appendicitis	5	Fibroma uteri	13
Hernia, obturator	1	Cystic ovaries	2

Thus, in this series of 100 laparatomies, divided among
thirteen members of the hospital staff, we find 4 cases, or 4 per
cent, of tubercular peritonitis. With these cases in mind let
us pass in review the conditions, symptoms, physical examina-
tion, treatment, diagnosis, and prognosis.

Age.—The ages of our patients were respectively 22, 23, 25,
and 30 years. From Osler's analysis[1] of 346 cases, in males
and females, this is the period during which it is most fre-
quently met with.

OSLER'S TABLE.

	CASES.		CASES.
Under 10 years of age	27	40–50	61
10–20	75	50–60	19
20–30	87	60–70	4
30–40	71	Over 70	2

Puerperæ.—Three of our patients were married women, and
the fourth should have been. Recent pregnancy is a well-
recognized factor, and in all our cases the first symptoms

[1] John Hopkins Hospital Reports.

appeared coincident with or within a short time thereafter. No. 1481, 22 years; last child two months ago; first symptoms one month. No. 2353, 23 years; no children; miscarriage seven weeks ago; first symptoms six weeks ago; second attack of gonorrhea. No. 2310, 25 years; last child five months ago; first symptoms one month; lost flesh and strength; pain two weeks. No. 1612, 30 years; last child two years ago; first symptoms two years ago.

General Condition.—While No. 1481 is put down as emaciated, the others were in fair health, and the examination of the lungs in all of them showed no signs of disease present. Unless there is tubercular disease in other organs, many patients with well-advanced tubercular disease of the peritoneum will give every appearance of being in robust health, and are thus very apt to mislead the examiner.

The *family history* was negative in 3; the mother of the fourth having died of "cancer of the womb."

Pain.—Associated with every variety of peritonitis we expect more or less pain. If it takes its origin from the pelvic organs, it is described by the sufferer as a sense of weight over the symphysis, or soreness over the hip, the sacrum, or lumbar region, more or less persistent, with exacerbations at the time of menstruation; others complain at intervals of sharp, shooting, followed by dull pain, and soreness along the thighs. Much of the pain may be accounted for by the agglutination of the intestines interfering with peristaltic action, coincident intestinal indigestion, excessive gas formation, constipation or constipation-diarrhea, and autointoxication.

Pain on urination was not complained of by any of our patients, but by Kelly [1] "is considered the most characteristic of all the symptoms. Out of 20 cases, only 3 were free from it; 14 complained of burning pain during micturition; in 8 of these frequency of urination was added, in 3 others there was incontinence with pain."

In children pain is usually sharp and lancinating.

Menstruation.—Where the disease is of recent origin and the patient's general health good, menstruation will not vary from the normal; but, of course, when the peritoneal lesion is secondary the general health will suffer and menstruation may be absent, scanty, or profuse.

Temperature.—The inception of tubercular peritonitis may simulate any other variety and be ushered in by a temperature

[1] "Operative Gynecology," vol. ii., p. 139.

curve ranging from normal to 102°, 103°, or 104°, with nausea,
vomiting, tympany, abdominal distension, tenderness, and
rapid loss of flesh and strength. The subacute variety is most
often characterized by a subnormal morning temperature (95 6°
to 96.5°), gradually rising to the normal late in the afternoon.
Osler[1] calls special attention to the fact that this feature may
continue for weeks and months, and yet he emphatically warns
us not to overlook those cases of latent eruption which develop
so slowly and so painlessly as to give not a single symptom.

Lungs.—Examination of the chest of No. 1612 showed flat-
ness over the left apex, the others being negative. Czerny[2]
regards tubercular infection of the peritoneum and viscera as
being, in the majority of cases, a secondary infection from the
pleura, from the intestinal canal, the mesenteric glands, or the
genito-urinary organs.

Polyuria.—W. S. Gordon[3] reports that a negro child, 6
years, drank two to four litres of water daily and passed the
same quantity of urine, of a specific gravity 1000, acid, no
albumin, sugar, or phosphates. Abdominal symptoms not
well marked until late in disease.

Pigmentation.—Increased pigmentation of the skin, particu-
larly of the face, is a symptom occasionally met with in this
disease (Osler).

Tubercle in the vaginal discharge in female children is
accepted as a means of distinguishing tubercular from non-
tubercular peritonitis.[4]

Classification.—In his masterly paper Osler[5] summarizes
the varieties of tubercular peritonitis as:

I. Acute miliary tuberculosis, characterized by sudden onset,
a rapid development, and a serous or sero-sanguineous exu-
date.

II. Chronic caseous and ulcerating tuberculosis, character-
ized by large tubercular growths which tend to caseation and
ulceration, leading often to perforation between the intestinal
coils, and a purulent or sero-purulent exudate, often sacculated.

III. Chronic fibro-tuberculosis, in which the process from
the outset may be subacute or may represent the final result
of the miliary form. There is little or no exudation, and the
tubercles are hard and pigmented.

[1] Ibid., p. 77.   [2] London Medical Recorder, March, 1890.
[3] Southern Medical Record, Atlanta, May, 1895.
[4] Vierordt: Deutsch. Arch. f. klin. Med., Leipzig, B. lii., H. 8.
[5] Johns Hopkins Hospital Reports, 1890, vol. ii., p. 70.

Diagnosis.—In no class of disease is it of more importance that, preliminary to the physical examination, a thorough preparation of the patient be made. Beginning three days before, the bowels should be thoroughly evacuated by repeated doses of castor oil and, if need be, stimulating enemata. The food should consist only of fluid diet, combined with an antifermentative to reduce to a minimum gas formation. The stomach should be empty, and. if not so, must be washed out by the stomach tube. The rectum must be emptied shortly before, and the bladder catheterized immediately preceding, examination.

Aspiration as a diagnostic measure is here mentioned only to be condemned. (1) Tubercles are rarely to be found in the fluid; (2) as the puncture may open a malignant cyst and infect the general cavity; and (3) aspiration of a pregnant uterus, mistaken for encapsulated fluid, has been reported.

Ovarian Cysts.—Our list of 100 included 14 cases in which it was necessary to exclude the possibility of the presence of tubercular peritonitis—viz., 4 large ovarian cysts, 2 large papillomatous cysts, 2 large multilocular cysts. 1 large broad-ligament cyst, 1 abdominal pregnancy, 4 tubercular peritonitis.

Of the 4 cases which proved to be encysted tubercular fluid. No. 1481 was diagnosed papillomatous cyst or tubercular peritonitis; No. 1612 was diagnosed ovarian cyst: No. 2310 was diagnosed ovarian cyst: No. 2353 was diagnosed encysted fluid.

The examination of these four cases involved so many points that it will be most profitable to study them *seriatim:*

Abdomen.—Dorsal position. The abdomen was symmetrically enlarged, rotund, very tense, larger than at full-term pregnancy; tumefaction directly in the middle line. Over the summit well-marked flatness, and tympanitic note at the base in both lumbar and hypochondriac regions. No change resulted when the patients were turned from side to side. Fluctuation was well marked in every case. The abdominal wall was not movable over the tumors, nor could any irregularities be made out on the surface. Abdominal tenderness on pressure was present in all, especially below the umbilicus. The tenseness of the abdomen, even when anesthetized, prevented the recognition of any nodules, enlarged glands, or masses which might have been in the abdomen.

The rapid central development of the tumors in three cases rendered doubtful their ovarian origin.

Per Vaginam.—In No. 2353 a mass the size of a small cocoanut, connected with the uterus, was felt on the left; no pedicle or other sign present nor impulse through the vagina. A sound was passed into each uterus, but the fundus could not be made out. The vaginal secretion was not examined for tubercle bacilli.

Multilocular cysts, though sometimes presenting irregularities in outline, are often so tense and inelastic as to be mistaken for fibroids or fibrocysts. The same holds good of papillomatous cysts before rupture, but after this has taken place we are apt to find irregular masses in the abdomen and occasionally secondary nodules in the pelvic or iliac glands.

Ascites.—The absence of any disease of the heart, liver, and kidneys, no anasarca, and the markedly encysted position of the fluid, preclude the likelihood of ascites.

Over-distension of the bladder was excluded by preliminary catheterization.

Hematometra is excluded by the menstrual history.

Fibromata.—Large subperitoneal, intramural, and submucous fibroids or fibrocysts represented 14 per cent of our cases, but as a rule were easily differentiated; the shape of the abdomen being quite different, conforming closely to the outline of the tumor, which lay more or less to one or the other side, connected with the uterus. Menorrhagia common.

Omental Cysts.—Accumulations of fluid may take place in the epiplöon, forming an elongated mass attached to the transverse colon, lying athwart the upper abdomen. The peritoneal surface may be covered with tubercles. The process is a latent one, associated with subnormal temperature plus a tubercular involvement of the pleura or lung, or both. Fagge [1] calls attention to the resonant percussion above unless the tumor lies over the colon.

Hysteria versus Peritonitis.—A. Jaenicke [2] claims that in 60 to 70 per cent of women, between the ages of 20 and 40, who are set down as hysterical, careful examination would reveal old peritonitic adhesions. The cause in about 75 per cent is extension from the sexual organs, in half of the rest from appendicitis, while gall stones, tumors, etc., are responsible for the remainder. Kelly [3] warns us that " tuberculosis must be borne in mind in all cases of pelvic inflammatory disease with

[1] " Practice of Medicine."
[2] New York Medical Record, April, 1894.
[3] Ibid., p. 140.

masses posterior and lateral to the uterus, with marked tenderness on pressure in the vagina or over the lower abdomen. The probabilities are still greater if encysted accumulations can be felt in the lower abdomen, more especially if a large amount of fluid has existed and been partially absorbed."

The writer distinctly recalls several of these cases which at the time of operation were attributed to gonorrheal infection, but the absence of pus, massing together of the intestines, and especially the friable condition of the tubes and ovaries, led to the belief that they were of tubercular origin. This class of patients require careful after-treatment, in the way of tamponade and tonics, to restore them to health and strength.

Benign Form.—We are indebted to the studies of G. Lasserre [1] for the clinical description of a type which he has called subacute peritoneo-pleural, a benign form of tuberculosis. This is primary and to be distinguished from the secondary form, in which the prognosis is grave. It is moderately sudden in its onset and may be accompanied by slight fever. The effusion lasts for some weeks or even months and then disappears spontaneously, although in some cases it must be removed mechanically. Adults in apparently good health are most often attacked. Pain is not great, effusion not abundant. It may simulate ascites or cancer of the peritoneum and pleura.

A fair number of these cases remain well, in others the improvement is but temporary. Some die from pulmonary disease.

Treatment.—The camphor-naphthol injection introduced by Rendu, while successful in his hands, has not been so fortunate in the practice of others. The insufflation of air, proposed by Nolen, has given good results in a limited number of cases.

Operation.—Ever since Sir Spencer Wells, in 1862, made an incision to evacuate ascitic fluid, and, much to his surprise, cured his patient, who was well nineteen years later, evidence has been accumulating in favor of this procedure.

Admitting that in some cases we cannot arrive at a definite diagnosis, it is the firm conviction of the writer that in no class of cases is the exploratory incision so clearly indicated (1) as a means of diagnosis; (2) as the only way to remove any new growth; and (3) as curative if the condition prove to be tubercular peritonitis.

It may interest you to learn, of the four cases under con-

[1] Jour. de med. et chirurg. pratiques, Paris, September, 1894.

sideration, that on making a median incision large quantities of greenish-yellow fluid were evacuated. The sac in all was made up of agglutinated intestines and the viscera. Tubercular nodules were scattered all over the parietal and visceral peritoneum, which was very much thickened. In No. 2310 the ovaries and tubes were removed; in no case were the adhesions interfered with. The cavities were irrigated with sterile water and carefully sponged dry. The abdomen was then closed, no drainage being employed; experience proves that drainage retards recovery and a sinus persists, sometimes for years.

Tubercles in Hernial Sac.—At the Surgical Section of the Academy of Medicine, April 10, 1899, Dr. Coley reported a case of inguinal hernia in which the peritoneal surface of the sac was found studded with miliary tubercles, evidently an extension from an abdominal infection. Dr. Dowd also mentions a case of double inguinal hernia in a young child in which the same condition was found bilaterally. No ascitic fluid was found in either case. Following operation, in Dr. Coley's patient, there was an elevation of temperature ranging from 99.5° to 101°, and in Dr. Dowd's patient the temperature in the afternoon, for three weeks, was from 100° to 101° per rectum. As these patients have not been seen since leaving the hospital, the ultimate result cannot be stated.

Summary.—In summing up the foregoing observations we are justified in concluding that:

1. Tubercular inflammation of the peritoneum is met with at all ages and is most common in early and adult life.

2. It is most frequently met with in women and between the ages of 20 and 40 years.

3. It most often originates in the pelvic sexual organs, and from that point may extend to the visceral and parietal abdominal peritoneum.

4. As a primary lesion of the peritoneum, it resembles in its inception, subsequent history, and final outcome the various forms of the same disease in other serous cavities. It may be secondary to tubercular disease in any other part of the body, especially the lungs and pleura.

5. The most distinctive features of this disease are: (*a*) a rather constant subnormal morning temperature, rising to the normal in the late afternoon, reaching a little above at night; (*b*) hypogastric pain on pressure, on walking, and when urin-

ating; and (*c*) the presence of tubercle bacilli in the pulmonary, cervical, or vaginal secretions.

6. Anesthetic examination in pelvic cases will often aid in clearing up the diagnosis, but when the abdomen is tensely distended with encysted fluid, unless immediately preceding operation, it will only subject the patient to useless discomfort.

7. A positive diagnosis other than by exploratory incision is in some cases impossible.

8. Early abdominal section, evacuation of the fluid, removal of the original focus, carefully avoiding any attempt to break up intestinal adhesions, thorough irrigation of the cavity with saline solution, and closure of the abdomen without drainage of any form, has been shown by later operations for other conditions, and on autopsy, to have resulted in permanent cure.

9. When confined to the pelvis, removal of the original focus usually results in a permanent cure of the disease.

10. Where fluid reaccumulates a second celiotomy will be curative or prolong life.

11. Tubercular disease in other parts, especially the lungs and pleura, is not a contraindication to operation, which will be followed by a more or less prolonged abeyance or retardation of the disease.

60 West Fifty-sixth street.

INTRAPELVIC ADHESIONS.[1]

BY

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In a standard text book on gynecology of about one thousand pages, less than one-third of a page is devoted to the distinctive topic of intrapelvic adhesions, and that *en passant;* another gives it no separate mention. It is surprising, on

[1] Read at the annual meeting of the American Association of Obstetricians and Gynecologists, held at Indianapolis, September 19, 20, and 21, 1899.

examination, to find how little notice it has received by authors and casual writers on gynecology and abdominal surgery— topics which in particular interest the members of this Association. While pelvic adhesions are frequently the accidents or accompaniments of varying pathologic conditions, it would seem, in matters of diagnosis and rational treatment, that their presence and influence are entitled to more careful and discriminating study and differentiation.

Any surgeon of considerable experience will, in a review of his cases, recall not a few in which adhesions were the principal factors of trouble, which were only revealed on opening the pelvic cavity; while in others, equally numerous, the adhesions were concomitants of pathologic states equally unexpected. These cases embrace wide extremes of symptoms, sometimes apparently out of all proportion to the gravity of the condition really existing. The failures to make correct diagnoses may arise from a variety of causes. Doubtless in the cases as they present themselves accurate diagnosis is, other things being equal, easier in females than in males, for the reason that bimanual palpation is more satisfactory and better reveals the true condition in the former than in the latter. Then, too, the thickness of the abdominal walls and the amount of adipose tissue, either intra- or extrapelvic, render difficult the revelation of the underlying structures, their exact location, and accompanying deviation from a normal state.

So great is this embarrassment in the obese that diagnosis from physical signs is abridged or altogether abrogated. As an illustration of this difficulty I can cite two cases recently of omental lipoma being mistaken for ovarian cyst in fleshy women by careful diagnosticians, and the abdomen in each instance was opened before the error became apparent. Another hindrance to an adequate and discriminating study of the pelvic cavity is muscular rigidity. While the recti muscles are the principal offenders, other muscular structures participate in the spasmodic action, giving the abdominal walls a tense, drum-like feeling. This rigidity is often sufficient to obscure conditions which otherwise would be easily determined. This rigidity may be voluntary or involuntary, subject to the control of the will wholly or partially, or due to reflex influences for which the patient is responsible. If voluntary, it may be overcome by gentle or persistently increased pressure, at the same time attracting the notice of the patient to some other consideration.

Muscular rigidity of the abdominal walls, localized it may be. has a special significance in appendicitis, ovaritis. and acute localized or general inflammations affecting the pelvic viscera.   All these should be taken into account as preliminary, on which absolute or approximated diagnosis may be arrived at, on which to formulate a plan for correct treatment.   How many failures and disappointments would have been avoided, and how much less scientific medicine would have suffered in the house of its friends, had such methods been uniformly pursued!

But notwithstanding all the failures and mistakes of the past, progress is being made.   It nevertheless remains true that he who fails from neglect is without excuse, and thereby hugs to his soul the instrument of his own punishment.   In passing it might be profitable to consider somewhat more in detail the obstacles to the diagnosis of intrapelvic adhesions and the means of their avoidance.   The character of the adhesions likely to be found must be included in the study of every individual case.   Adhesions will vary according to the variety of inflammation producing them and their plasticity, and this in turn will be dependent on the dyscrasia of the patient, while the proximity or remoteness of the period of their occurrence is a factor to be included in the analysis of each case.

Recent adhesions lack the strength and resistance of older ones, and those formed in the presence of septic conditions and in the exudations about tubercular and other degenerative deposits and malignant growths have a low order of vitality. Allusion has been made to the necessity of muscular relaxation as needful to proper superficial and deep palpation and percussion in arriving at accurate conclusions, and, if needful, anesthesia should be resorted to for such purposes.   The mobility of the pelvic contents perhaps furnishes more decisive information than any other single symptom or condition. Advantage will be found, in making the most of it, to vary the position of the patient from side to side from a horizontal to the upright posture, and in changing it again to the Trendelenburg, and from that to the knee-chest position.   By such procedure, combining with it, it may be, percussion and palpation, and taking into account the presence or absence of pain, valuable information is elicited.   In this procedure too forcible handling of the parts must be avoided.   Doubtless rash efforts in this direction have ruptured many a pus sac, with its fateful consequences, while it remains equally true that careless or super-

ficial examinations have failed to differentiate easily determined conditions. A careful and logical study of the antecedent history of the patient will afford valuable information. Has the patient suffered from previous peritonitis, salpingitis, metritis, or pelvic cellulitis, and, if so, how much has this contributed to the present status of the case ? What sequelæ are due to pregnancy, sepsis, tuberculosis, syphilis, etc. ? Has traumatism been a factor in the pathologic condition present, and, if so, how is it responsible for impaired health or threatened invalidism ? If, when all these and other details have been systematically studied and deductions formulated, including with the physical signs all the light a thorough analysis of the rational symptoms affords, doubt and uncertainty remain, resort to abdominal section may be needful to establish a certitude in diagnosis. While a careful application of these principles for purposes of general diagnosis always obtains, their necessity in cases of suspected adhesions is specially demanded. It is only by such a course of observation and deduction that proper knowledge of intrapelvic adhesions can be diagnosticated. Should abdominal section be decided upon to complete the diagnosis in case of expected adhesion, the operator may, with the consent of the patient or friends of the patient, be prepared to do whatever is found needful. It is almost superfluous to mention that such procedure assumes that needful preliminary steps have been taken to put the patient in the best possible condition for operative interference.

The study of the nature and influence of intrapelvic adhesions would be an interesting and fruitful topic for this entire paper, but cannot be dwelt on to any considerable length. The deleterious influence arising from their presence is of a mixed character, being partly functional, partly mechanical. The mechanical disability, so far as the intestines are concerned, arises from narrowing of the lumen of the gut, angulation and interference with normal peristalsis, all of which tends to the development of constipation and consequent fecal accumulation and fecal impaction. The discomfort and disability arising from constipation is closely allied with ailments far-reaching in their effects and consequences. Constipation is doubtless a fruitful cause of fecal poisoning by absorption of ptomaines, which play so important a rôle in the development of anemic and lithemic states of the

system and some undefined disturbances of intestinal digestion and nutrition, and also in the production of varicose conditions of the hemorrhoidal veins, chronic proctitis, and rectal ulceration, together with venous congestion of the whole pelvic contents and return pelvic circulation. Adhesions of the bladder to the uterus, ovary, broad ligament, or intestines give rise to an aggravated form of cystitis and cystic irritability difficult of cure except by removing the cause. The vasomotor disturbances and reflex irritation accompanying these conditions present another perplexing feature of the lesion which clamors for relief. Among the simpler forms of intrapelvic adhesions are the presence of bands which, by their progressive contraction, obstruct the bowels. The symptoms of this will vary according as it is an acute or chronic condition, and are usually too simple to give difficulty in correct diagnosis. Unfortunately it is this class of cases in which the plain indications for prompt interference are disregarded with appalling consequences. Repeatedly in the past few months have cases come under my observation, both in hospital and private practice, where the golden opportunity for conservative interference had passed.

On opening the pelvic cavity the first adhesion encountered is that between the abdominal peritoneum and the omentum, making difficult, in some cases, certainty when the peritoneal cover has been passed. The adhesions may be between omentum and the intestinal peritoneum, between intestine and intestine, intestine and ovary, tube, appendix, etc., sometimes to a degree which amalgamates all the intrapelvic structures, displacing altogether the normal relations of these organs. You are all familiar with the wide variations these adhesions present. In one case an ovary is constricted by a single band of lymph, which has resulted in persistent and uncontrollable neuralgia. In another the ovary is attached to intestine, uterus, or appendix; the uterus is held in abnormal backward, forward, or lateral position. Again, these several organs are adherent to a neoplasm, or pus tube, or abscess sacs, presenting in variety of detail a multiplicity too great for present enumeration. What shall be done with them? On the judicious answer to this question will hinge the whole theory and practice of rational procedure. Sometimes the surgeon will respect them and let them alone. Again, their blight and vicious influence will be the signal for his attack. Where their presence is general it is obvious their obliteration is out-

side the limit of conservative surgery; yet in cases not a few the removing of tension at some point will afford measurable relief. The adhesions which will tax the skill and dexterity of the operator are those covering in old abscesses, holding in position intraligamentous growths, and the new adhesion between the living placenta and intestines following the rupture of ectopic gestation, and those encountered in intestinal resection.

In view of the disability arising from these conditions, it is well to raise the inquiry, What can be done to prevent their development? A comprehensive answer would be to arrest the septic and inflammatory processes on which their presence depends. It has long been recognized that two drugs possessed greater or less influence on the development of new connective structure, potassium iodide and mercurials, to which may be added one of the newer preparations, gold and sodium chloride. The judicious and timely use of these remedies may arrest the processes which make for injury.

The success of the Brandt method of pelvic massage has, it seems, claims on our recognition, but I am unable to speak from personal experience. Usually when these cases of extensive adhesions reach the observer the mischief has been done and the appeal is made for surgical interference. It is, however, well to remember in some cases that time will bring a degree of relief, while in others it increases the suffering and disability. The danger of dealing *per se* with those adhesions is twofold: first, the liability to hemorrhage, and, second, the liability of new adhesions forming. When practicable, if the adhesive bands are of sufficient size, they should be severed as near their origin or insertion as possible, the blood vessels tied, and the cut surfaces turned in on themselves and stitched over with the finest catgut. This reduces the risk of new adhesions to the minimum. The principal embarrassment in actual operation arises from bleeding and oozing from the hyperemic condition of the parts. Particularly is this true in chronic and subacute inflammatory states. Under certain conditions the tearing across so lacerates the vessels as to prevent bleeding. In some cases the oozing can be controlled by combined pressure and hot-water sponging.

When torsion or ligation of the vessels is impossible and other devices have failed, it occasionally becomes necessary to

apply more permanent pressure by gauze packing, which must be allowed to remain until the vessels are occluded. This. of necessity, prevents closing the peritoneal cavity both in abdominal and vaginal section. The liability to new adhesions succeeding old ones seems to some degree to be diminished by sponging the location of the old adhesions, after their separation, with hot salt solution or allowing a portion of it to remain in the peritoneal cavity, when not contraindicated.

Finally, we have encouragement for the future in the application of electro-hemostasis, so ably discussed by Dr. Skene in his work entitled "Electro-Hemostasis in Operative Surgery."

263 Hancock Street.

NIGHT-TERRORS.[1]

BY

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WILLIAM B. HAZARD, in the *Missouri Clinical Record*, says "the night-terrors of children are recognized by writers upon the diseases of childhood, but their significance has perhaps not been so well appreciated as it should be by practitioners." He also states that the object of his paper was not only to indicate the causes, etc., of the disease, but "its right to a place among the well-known neuroses."

My attention has been frequently called to this trouble by parents, and they have also stated that at times they had spoken to physicians about them and had been told not to bother about them as the child would soon outgrow them.

Because of the very fact that physicians do sometimes make light of these troubles, and believing that they make a mistake in doing so, and also feeling sure that night-terrors frequently lead to more serious disorders, I have chosen them for a subject of discussion. I believe that night-terrors are prone to run into more serious functional neuroses, such as chorea, hysteria, or even true epilepsy. If this is true, we make very great

[1] Read before the Washington Obstetrical and Gynecological Society, June 16, 1899.

mistakes in passing them over lightly instead of telling parents
of their importance and putting the child on proper treatment.

Night-terrors appear to be, to a certain extent, hereditary.
Of course we all know that certain families in whom there is
a neurotic tendency are apt to have children of a nervous,
impressionable temperament. I have a little patient whom I
have treated for a mild chorea, who is excessively nervous and
impressionable in the daytime. Sometimes in the night he
has spells of crying, apparently from fear, and no amount of
scolding or threats will stop him. His father is a nervous,
excitable man, who, I am told, had night-terrors when a child.
Bartholow reports an interesting case to illustrate the relation
between night-terrors and nightmare and nocturnal epilepsy.
Although his case was that of a man 22 years of age, he states
that if the case were neglected it would lead to epilepsy.

I have not been able to find out whether those children who
are raised in the South and have negro nurses are more prone
to night-terrors or not; but we know that negroes are, as a
rule, very imaginative and superstitious, and the nurses tell
children the most thrilling stories, and even have a way of
managing them by telling them that the " old bear " will catch
them or that the " old buggerman " will get them, and thus
frighten them into obedience.

As Hazard says: " Children of a nervous, impressionable tem-
perament, especially those in whose family there is a neurotic
tendency, are prone to suffer from these nocturnal attacks.
This tendency of a neurosis of whatever character, be it neu-
ralgia, insanity, chorea, paralysis, or chronic alcoholism in the
ancestry, to manifest itself in some allied nervous disorder in
the offspring, is shown by the affection now under considera-
tion. Without some neurotic tendency of some sort in the
ancestry, night-terrors will seldom or never occur in our little
patients." He also states that age has a powerful predispos-
ing influence; it is seldom observed before the first dentition
is accomplished or after completion of the second. Sex has
seemed to exercise little influence in the cases observed by him.
The same observation applies to season and climate. " De-
pressing moral and physical causes seem to exert a powerful
predisposing influence; thus, the fatigue of a hard day's play,
overwork of the mind in study, or the observation of many
new objects of interest, the effect of sudden fright or of fright-
ful stories and menaces, have often been observed to precede
the attacks, and certainly stand to them in a causative rela-

tion; negro stories frighten children." He cites as causes gastro-enteric troubles, overloading of the stomach, and a full bladder.

There seems to be a considerable difference of opinion between some of the writers on the subject as to whether night-terrors and ordinary nightmare are one and the same or separate and distinct diseases. In my small experience I have thought that night-terrors were a true neurosis, and that nightmare was merely a bad dream, the result of an overloaded stomach or indigestion; and yet the relationship must be close, because we know that in epileptics one of the most frequent exciting causes of an attack is eating too heartily or eating something that is hard to digest.

Eustace Smith says that in his experience all cases of night-terrors are merely attacks of nightmare, the consequence of indigestion and acidity, and can at once be arrested by diet and suitable treatment.

On the other hand, Hugh T. Patrick, in Hare's "System of Practical Therapeutics," goes into the subject much more fully, as follows: "Night-terror, pavor nocturnus, is almost confined to childhood and constitutes a reasonably distinct neurosis. Some attacks are doubtless simply examples of nightmare caused by errors in diet, and others approximate mild somnambulism, with visions of people and objects. Still others are to be classed as juvenile hysteria. Adenoid vegetations are responsible for a considerable number of nocturnal nervous attacks in children; but besides all these there remains a tolerably definite paroxysm still to be accounted for. This comes on ordinarily an hour or two after the child has fallen to sleep, suddenly in the midst of quiet slumber, and occurs but once in the night. The child has its eyes wide open, screams with terror, evidently has visual hallucinations of a frightful character, and does not recognize persons, although he will often cling to them in his fright. The attack is of short duration, but the child is timid and does not recover for some time after. It approaches dangerously near to epilepsy and should be treated as incipient epilepsy. Night-terrors due to an overloaded stomach are not so serious."

Sydney Ringer, in the *Medical Times and Gazette* of London, does not draw a very sharp distinction. Under the head of "Screaming Caused by Nightmare" he states that "such screaming may occur in children in all ages; but while it is met with in children of 10 or 12 years of age, it is of more

common occurrence in those of a few months to 2 or 3 years old. This screaming differs from delirium, as it does not occur in those diseases accompanied by delirium." He also states that such children are generally pale and badly nourished and out of health. Some have constipation and others diarrhea; some frequently have worms. "They are generally worse when the teeth are making their way through the gums although the irritation and pain which arise from teething appear to be incapable of themselves of exciting this screaming." My own experience has been that the children are not necessarily pale and in bad health, but. on the contrary, robust and physically very healthy.

In all diseases pertaining to children most of us turn to Holt. He states that there are " two classes of night-terrors. One, that of nightmare, may be caused by asphyxia, from adenoid growths of the pharynx, or from intestinal or gastric disturbance. The sleep may be disturbed from the onset and it may be the culmination of such a disturbance. The child awakes in a state of excitement and fright and says often that he has had a bad dream. The mind is clear, he recognizes those about him, etc., but it is a long time before he is calm enough to go to sleep again. The attack may be remembered perfectly the next day. The second group is rare, but the condition is much more serious. It is due to disturbance of the central nervous system. It is liable to occur (according to Coutts) in those of neurotic antecedents or those who have previously suffered from infantile convulsions, and it is often the precursor of other nervous attacks, such as migraine, hysteria, epilepsy, and even insanity. The child is quietly sleeping in the early part of the night, as a rule. He is generally found sitting upright in bed in a state of terror, afraid of 'the dog' or 'the bear' or some other vision or hallucination. A red color is often associated. The child does not recognize those about him or where he is, and may go to sleep again without coming to full consciousness. He does not recollect it the next day. Usually there are no after-effects but a large amount of pale urine. The attacks are irregular, may come on in a few months or even in a few nights. The vision is liable to be repeated in nearly the same form. Such attacks have something in common with epileptic seizures, and the diagnosis is sometimes difficult. They are always to be regarded seriously on account of what may follow."

One of the best articles that I have seen on this subject is

written by J. A. Coutts in the *American Journal of Medical Sciences*. His views practically agree with those of Holt. He states that "there are two groups: one, partial asphyxia owing to abdominal trouble, naso-pharyngeal trouble, or poorly ventilated sleeping apartments; the second group, central in origin and manifestations of present brain disturbance and the harbingers of possible further neuroses in the near or distant future. The first are of little import, being reflex from abdominal or nasal trouble; the second class are much more grave as to present and future. As a cardinal point in night-terrors the patient should see visions; in nightmare it is sufficient that he should dream dreams. They seldom occur under 2 years or above 8 years. In nightmare there are no such limits; it occurs in adults. In a large percentage there is a family history of neuroses, such as epilepsy, hysteria, chorea, etc. Usually there is only one attack of night-terrors in one night; not so in nightmare. In a typical attack there is a sudden agonizing scream of terror; he is seemingly wide awake, sitting up in bed or crouching in a corner in a state of excitement: he converses with or protests against some imaginary person. Gowers has pointed out the fact that red is the visual aura of epilepsy. He usually goes to sleep again and does not remember it in the morning." Coutts says that he has known more than one case where epilepsy followed night-terrors, but epilepsy is not the most frequent sequel; there are others, such as hysteria, chorea, migraine, insanity, and somnambulism. Somnambulism and somniloquence are frequent attendants.

In the *Journal of Psychological Medicine*, J. W. Winn goes into the subject very fully and in addition relates his own experiences. He, however, does not draw a very fine distinction between night-terrors and nightmare. He says in substance: " Nightmare and dreaming are so closely entangled that it is impossible to study their phenomena apart. Nightmare is a nervous disease, *sui generis*, and there is no sense of that weight on the chest so generally complained of; it was chiefly a vague, supernatural horror and dread. Incubus— from *incubo*, I sit upon—appears to be a misnomer. Some writers consider that an essential feature is an active state of the memory and imagination, and an impaired condition of the respiratory functions, and a torpor of the power of volition." He has records of 112 attacks himself. A few of them are as follows: "first attack was that feeling of dying, no physical

cause could be assigned; second attack was preceded by pal-
pitation and tinnitus aurium; third attack accompanied a
dream; the fourth was a severe attack, no palpitation; the fifth
attack was after severe fatigue ascending a mountain; in the
sixth attack he knew in his sleep it was nightmare, and longed
to be aroused; eighth attack, an inability to expand his lungs."
According to this author it is a mistake to suppose that lying
on the back is a source of nightmare; that he has repeatedly
observed that the posture has little to do with it.

While I am not able to say that the posture does have
something to do with causing night-terrors or nightmare, yet
it seems to be a fact that sleeping on the back, in some young
men or youths, appears frequently to cause lascivious dreams
and seminal emissions, and various ways and means have been
devised to prevent them from sleeping on their backs.

Winn discusses at some length the causes of these attacks.
He says that while an overloaded stomach in some persons
may produce nightmare, he frequently had attacks himself
when he had eaten very slight meals and consequently was
perhaps in want of food. He gives spasm of the diaphragm as
a probable cause. As an explanation of the phenomena he
asks the question: "Is it not possible that from some acknow-
ledged condition during sleep the motor ganglia have tempo-
rarily ceased to supply the nerve force necessary for the due
performance of the voluntary movement? Is not this notion
more conceivable than the generally received opinion that the
will is in abeyance and entirely separated from those voluntary
muscles which are ordinarily under its control? I have felt
during these attacks that I had the will but not the power to
shake off the death-like torpor. The fact that I distinctly
recollect having on one occasion overcome a nightmare in my
sleep by sheer force of will supports the theory. If sleep be,
as is commonly supposed, a state of inaction or rest of the or-
gans of sense and motion, either partial (as in somnambulism)
or entire (as in deep sleep), it is reasonable to infer that in
nightmare the sleep of those organs actively engaged in com-
municating nerve force to the voluntary muscles has become
so profound that they do not respond to the promptings of the
will. As soon, however, as the motor ganglia become aroused
by the waking state, the nerve force is sent along the motor
tracts and the nightmare spell is broken. May not the night-
mare agony be a provision of nature to awaken the sleeper and
thus provide for the due performance of the muscular move-

ments, both voluntary and involuntary, which if not restored would cause death by apnea?" I presume that it is not known whether or not the circulation and respiration are affected during the attack, as I have seen no report from any physician who had examined the patient during the attack. When our attention is called it is usually after the spell is over. It is said that it is not necessary to be asleep to have night-terrors, but only in a dimly lighted room.

Without attempting to prove that night-terrors and night-mare are the same or that they are separate and distinct diseases, I feel sure that all of us will agree that they should not be allowed to run on if they can in any way be stopped. There are some arguments in favor of each theory. We know that the attacks of such a grave disease as epilepsy are frequently brought on by overloading the stomach or by constipation, even when the patient has not had an attack for a long time; and, on the other hand, attacks of night-terrors sometimes occur when there is no constipation and no overloading of the stomach, but even, as Winn says, when he had eaten so little that he might have been in want of food. My experience has been limited, but I think that it requires more treatment than the mere correction of acidity or the unloading of the bowels. The bromides will almost always have a good effect, and should be combined with such other drugs as would be indicated, according to the symptoms. Of course it goes without saying that all other exciting causes, such as acid stomach, indigestion, constipation, elongated prepuce, accumulation of smegma, etc., should be looked after and corrected.

1512 Q STREET.

THE USE OF GLOVES IN ABDOMINAL SURGERY.[1]

BY

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BEFORE the era of modern clean surgery, septic infection was exceedingly common. It was probably the rule and not the exception for this complication to seriously increase the mortality and more particularly the morbidity of all surgical

[1] Read before the Washington Obstetrical and Gynecological Society, June 2, 1899.

procedures. Changes in technique with cleaner methods greatly improved the prevailing results, yet much was desired in that direction. Antiseptic surgery still further advanced the science, but could not be carried out to the desired extent, and aseptic work with a faulty technique was resorted to as a substitute. This, too, proved unsuccessful, and it was found that a combination of the two methods was nearer the ideal plan. Septic infection during surgical operations may come from some focus in the patient, but is far more frequently introduced from without, the hands of the operator or assistants, the dressings, and other means acting as vehicles. Such infection does not in all cases cause death, and the mortality of it in abdominal surgery is perhaps not so high as many might believe. However, it is not uncommon to have this condition make its appearance shortly after operations, and its annoyance to the surgeon is of no small moment, inasmuch as what may at first have practically the appearance of innocence sometimes encroaches so insidiously or so rapidly on the vitality of the patient as to produce a fatal *dénouement*.

This condition has so constantly been present that the surgeon who is so perfectly satisfied with his technique that he does not strive to improve it is considered dangerous. It has been found necessary to put the field of operation into a condition of asepsis to the nearest possible degree and to allow nothing to come in contact with such field that is not in the same condition.

All have been striving to substitute absolute for relative sterility in this work, which accounts for the many little differences in the details of technique of the best surgeons. The dressings, instruments, suture materials, etc., can be absolutely freed from all living micro-organisms by various plans of sterilization, and this negative condition can be maintained almost at pleasure. The air of the operating room is by no means free of pathogenic organisms, though this has probably been slightly exaggerated. Nevertheless the air of the operating room should not be disturbed unnecessarily while instruments, tables, and other paraphernalia of the surgeon are uncovered. In this connection it may be well to emphasize the advisability of surgeons and immediate assistants wearing hair and beard coverings, and the assisting nurses a complete hair covering instead of a small exhibition cap perched upon the top of a heavy suit of hair with its greediness in accumulation of dust and microbes and its equal generosity in parting with them

about the patient. It is absolutely harmful and very common for surgeons to talk freely over an open wound and for them and their chief assistants to breathe directly into it an effluvium that would nauseate onlookers at a short distance. The face mask is probably a step in advance. In the technique of abdominal surgery we have left practically but two points to consider—the preparation of the field of operation and of the hands of the operator and assistants.

Of the former we will mention only the necessity of sterilizing deeply into the sweat glands and deeper skin layers with as little traumatism as possible. The part of especial moment in this paper is the necessity of having as clean hands as possible and of absolutely insuring the patient against infection from the hands. These bring abdominal surgery almost absolutely sure from infection from without. McBurney [10] says: " My conclusion is that the real source of infection of a wound deliberately made by a careful surgeon who uses perfect materials and handles them perfectly is to be sought either in the skin of the patient or in the hands of those directly concerned in the operation." The number of experiments made in the bacteriological investigation of hand sterilization are legion and with practically unanimous conclusions that it is not reliable. It may not be amiss to briefly mention those of Leedham–Green [*] which follow:

1. Simple washing five to fifteen minutes with soap, hot water, nail brush, and cleaner: 25 experiments, 2 sterile and 23 strongly infected. 2. Soap, water, and sand, as advised by Sänger and Witkowski : no better results. 3. Soap. water. and turpentine (brush dipped from time to time in pure spirits of turpentine): 6 experiments, all infected. 4. Alcohol—hands first washed in several waters to remove dirt, then scrubbed with sterile hot soap and water, and in the middle of the process a sterile ivory nail cleaner used; hands rinsed in sterile water to remove soap, and then treated with alcohol (either absolute or methylated spirits, 96 per cent): now freely rinsed with hot sterilized water and tested: 12 experiments, 2 sterile and 1 almost sterile. 5. Ether—same results. 6. Corrosive sublimate and washing—one to five minutes in solution of corrosive sublimate from 1 : 1000 to 1 : 5000: 11 experiments, 2 sterile and 4 almost sterile.

Suffice it to say no one has the temerity to state his ability to absolutely sterilize his hands. This being true, it seems necessary to take extra precautions toward protection of the patient

from hand infection. And here I will mention another important point, that of inability to prevent the degree of infection of the hands from increasing during operation, and will speak of it again in discussing the varieties of gloves.

The use of gloves is of rare antiquity. There is reason to believe they were in use twenty-five hundred or three thousand years ago, as it is mentioned in the " Cyropedia " of Xenophon that on one occasion Cyrus, King of the Persians, went without his gloves; and we know that some kind of protective covering for the hands was used by the Greeks and Romans in certain kinds of manual labor, although their precise form is unknown. A pair of gloves are mentioned in the will of Bishop Riculfus, who died in 915. Henry II. was buried in them in 1189. They came into general use in England in the thirteenth century. The costumes worn by our forefathers to keep away the plague were not complete without the gloves, and the finished surgeon wards off the surgical plague by wearing the addition to his uniform of impermeable, sterile gloves. It has now come to be considered a part of the abdominal surgeon's technique to wear sterilized, impermeable gloves during operations. Some, however, are wearing permeable or slightly permeable ones for various reasons, such as increased tactile sensibility of finger tips, durability, and cheapness. Unquestionably these men are doing better than wearing no gloves. I have been unable to learn who first used gloves in surgery, though Keen, McBurney, and others claim Halsted was the first. There are a number of claimants for this honor, and it is presumed the work of each was independent.

Various materials have been utilized in glove making for the surgeon. Fine silk, Lisle thread, cotton, rubber, rubber-and-silk, and taffeta are noted. Thomas [9] prefers buttonless thread gloves, as they are closely woven, fit well, stand any method or amount of sterilization, and cost very little. Other operators prefer other materials. There can be very little doubt the impermeable rubber glove is best, though according to Mikulicz [1] the cloth gloves are very much better than none. He found that on cloth gloves worn during long operations microbes were found but 84 times in 100, while cultures taken from the hand just as it was taken from the glove always—100 in 100— showed microbial growth. He was impressed with the rapid and marked lessening of the proportion of sterile hands during a few minutes following the cleaning. He noticed the proportion of sterile hands was 59 to 78 per cent, and that

a few minutes later this had decreased to 47 per cent and
even less.   This was accounted for by the bacteria on the sur-
face of the skin being killed or removed, and later, by move-
ments, perspiration, etc., germs came from the deeper recesses
of it and reinfected the surface.   He is well pleased with the
use of gloves, as evidenced by his statement that they have
contributed to carry his recovery rate from 83 to 94 per cent
and with less operation morbidity.

Attempts have been made to render the cloth gloves imper-
meable by the application of oil, turpentine, and other sub-
stances.   C. Menge, of Leipzig, has succeeded fairly well by
the following process: they are oven-dried, soaked in alcohol
(absolute), then in pure xylol, again in fresh xylol; fifteen min-
utes in a 10 per cent solution of a low melting point paraffin in
xylol and then wrung out and dried.   Foote[7] in speaking of
this process commends it highly, calling attention to its close
comparison to the process of preparing microscopical material
for embedding, while Lockett[16] claims it to be very defective.

If by any safe process cloth gloves can be rendered imper-
meable, their superiority over rubber gloves is at once estab-
lished.   Otherwise the rubber ones are preferable from their
impermeability.   Zweifel wears linen sleeves that fit close to
the gloves.   Robb wears rubber gauntlets.   Zweifel's gloves
are heavier than those in use in this country, have no finger
tips, but separate fingers over which he wears thin, long rubber
cots.   This is from economical reasons.

On returning from my summer vacation last year I began
the employment of rubber gloves for myself and chief assist-
ant, and cotton gloves for the nurses handling instruments
and sponges, in my abdominal work in Columbia Hospital and
later in my Providence Hospital service.   In but two cases has
there been infection, and in both of these bowel resections were
made and bacteriological examinations demonstrated the colon
bacillus to be the only organism present.   The cloth gloves
were sterilized by moist heat.   The rubber ones were boiled
five minutes in a $1:64$ solution of carbonate of soda, the
gloves being carefully filled with the same solution.   They
were then soaked five minutes in a $1:2000$ corrosive sublimate
solution, and dried.   The gloves may be sterilized by submit-
ting them for thirty minutes to formaldehyde gas in a formal-
dehyde sterilizer. care being exercised that the surfaces be
kept apart.   It is said to injure them less than other methods.
Sterilized talcum powder or French chalk is usually employed

as a lubricant for fitting them to the hands, though corrosive
sublimate solution and sterilized water have both been used for
this purpose, the glove being filled by the fluid and the hand
plunged into it. We have cleansed our hands just as carefully
to use the gloves as was usual without them. This is neces-
sary, as gloves may accidentally be perforated during opera-
tion. Permeable cloth gloves require frequent dipping of
hands in antiseptic solution and rinsing with sterilized water
or salt solution; or, as is customary in Germany, frequently
changing gloves during operation, which to me seems much
delay, a matter of importance in some cases.

The advantages of rubber gloves in surgery are, first, pro-
tection of patient against infection from operator's hands, and,
second, protection of the operator's hands against infection
from the wounds. A number of operators use rubber gloves
only when they have been in infectious cases previously and
fear carrying infection to cases subsequently operated upon.
To me it seems we cannot well be certain any given case has
not been infected, and therefore the safer plan is to wear gloves
in every case. When we leave a case undoubtedly infected
we feel a great degree of safety by having worn the gloves.
It is extremely difficult, perhaps impossible, to know our as-
sistants' hands are even as sterile as ours. The use of gloves
affords us the satisfaction of knowing their hands, no matter
how much soiled, are not to come in contact with the wounds.
Thomas, in speaking of private-house work, facetiously says:
" Gloves for unknown assistants are excellent, as the awe of
the gloved hands prevents assistants from feeling impelled to
feel the patient's pulse or open a door or window during the
trying vicissitudes of any long operation." It requires con-
siderable courage to thoroughly scrub sore hands, and still
more to put them in the position of being readily infected or as
easily infecting a surgical wound on a patient. We can get
along with less scrubbing with gloves and certainly avoid
danger of infecting them. The use of gloves prevents us car-
rying about on our hands the well-known " operation odors "
so objectionable to many people, and permits the surgeon as
well as other people to have well-shaped finger nails—a rare
condition among surgeons. In emergency work, in which the
necessary time for thorough scrubbing is ofttimes ill-spared, as
well as when many cases are to be dressed in succession, their
use no doubt would be of great convenience and safety.

The objections to the use of gloves in abdominal surgery—a

field requiring so much deftness, such highly developed tactile sense and great speed in manipulative detail—are that some difficulty in threading needles, in tying ligatures, and in manipulating instruments exists, as well as a handicap to the sense of touch. Besides these are such others as expense, estheticism, and an additional complication in the technique of surgical operations. The difficulty in needle-threading is of no moment if one assistant hands instruments and sutures, as ample time for such work is afforded. In case of dispensing with such assistant, ligature carriers, as usually employed by some surgeons, may satisfactorily be brought into use. There is some difficulty in tying ligatures, but a little practice materially lessens this. In handling instruments practice does likewise. After some experience with thin rubber gloves the tactile sense is practically unimpaired. The employment of the advantages of certain positions—Trendelenburg's, for instance—may be said to entirely remove any such difficulty. The expense of anything to alleviate suffering or to prevent death is of very slight moment. To consider the cost of rubber gloves would be like ignoring aseptic and antiseptic agents for economical reasons.

If gloves are as beneficial as they have been proved, then the surgeon using them should be regarded as doing his duty rather than as using them for affectation. It is to be regretted that surgical technique is so complicated, and all agree that one simpler than we usually employ, and as efficacious, would be a great advancement.

The use of rubber gloves does complicate it more in some cases if the hand sterilization is carried out. But to me it seems these extra complications are beneficial, as they instill into assistants a proper respect for aseptic work. I feel the employment of rubber gloves in abdominal surgery is a decided step in advance, and the abdominal surgeon should consider their use as necessary as sterilization of his paraphernalia.

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EXPERIENCES WITH INTRAUTERINE VAPORIZATION.

BY

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Visiting Gynecologist to Beth Israel Hospital; Attending Gynecologist to
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(With one illustration.)

IN the *New York Medical Journal*, May 13, 1899, I published a paper on the above subject and included a brief account of 21 cases. I have since then been able to add 20 other cases, making a total of 41. The treatment has been applied by means of the apparatus of Ludwig Pincus.

I have resorted to vapo-cauterization in only 4 of these cases. Its application implies the use of dry heat to the entire uterine mucosa, and the only fatal case on record (Treub's) was due to perforative peritonitis after its use. In the remaining 37 cases I have relied upon the effect of superheated steam, the fenestrated catheter being introduced just beyond the internal os.

Two of my patients were virgins and the treatment was applied under anesthesia. The ages of the 41 women ranged between 19 and 44 years.

The indication in 5 cases was profuse uterine leucorrheal discharge. From 2 cases I have no subsequent report. One case (of gonorrheal origin) was partly benefited. Two cases were distinct failures. My experience, then, in this direction has been very discouraging.

Eleven women had been curetted once or several times for persistent or irregular uterine hemorrhages without benefit. It is with pleasure that I note that, after periods of time vary-

ing between two and twelve months, 6 were permanently cured, 2 were failures, and 2 were not heard from.

In 2 cases of failure I was permitted to use the method a second time, and in both of these cases the second application was successful.

In 22 cases no anesthetic was used, the treatment being carried out at the hospital, in my office, or before the class in
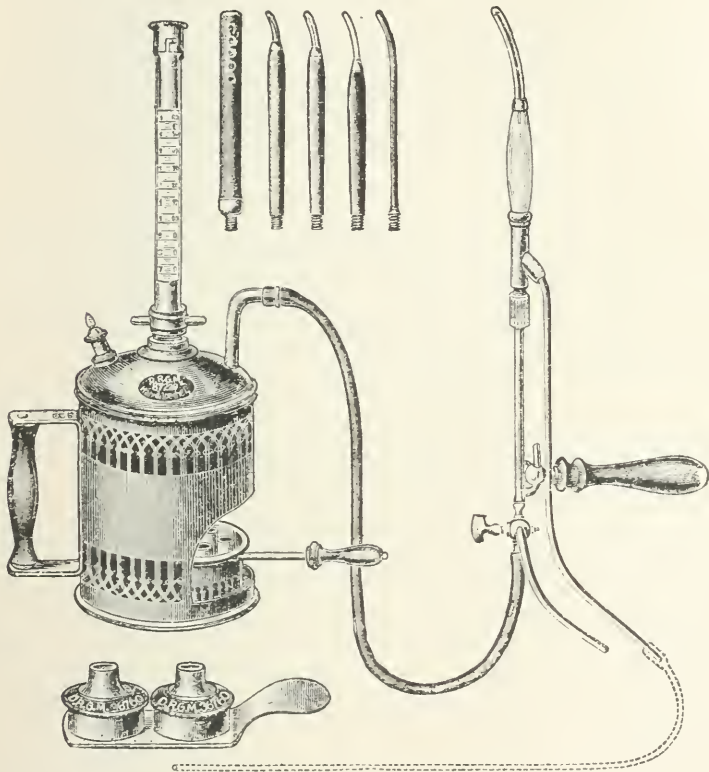
Vaporizer of Ludwig Pincus.

the lecture room. With one exception the patients were able to walk or ride home.

The exceptional case occurred in an anemic, debilitated woman who had suffered more or less continuously during six months from profuse uterine hemorrhages. The first vaporization (105° C. during fifteen seconds) having failed to give any relief after five weeks, I decided on a second application of steam heated to 110° C. and applied during sixty seconds.

Without anesthesia the treatment had been applied for forty seconds, when the patient suddenly became limp and partly unconscious. The pulse became very slow (about 60 per minute) and barely perceptible. The treatment was promptly suspended. After an hour's work with stimulants she failed to rally, so that I had her transferred to the hospital in a carriage. In the course of several hours she gradually came to, but seemed to be so weak that I kept her in the hospital for observation during the next seven days. At the end of this time she was able to get about, but the bleeding persisted. I then proposed a radical operation, to which she refused to submit. After a month the bleeding ceased and has remained away ever since, probably because of complete obliteration of the uterine cavity.

The immediate effects in nearly all of the cases have not been bad. In most of the ambulant cases, in whom no anesthetic was used, there was a surprisingly complete absence of pain during the application of the superheated steam. For several days later many complained of vague pelvic pains, which usually disappeared entirely. In all cases a free leucorrheal discharge, sometimes blood-tinged, made its appearance. This was quite offensive in one case. The fluor, however, usually completely disappeared after a time. Only in the cases vaporized for persistent uterine leucorrheal discharge did the treatment seem to be of little value.

In fact, one young woman, vapo-cauterized over a year ago for a uterine discharge of gonorrheal origin, tells me that the discharge at times is worse than ever. It may be, however, somewhat of a consolation to add that two previous attempts to cure the discharge by means of curettage, as well as any amount and variety of local procedures, have equally proved inefficacious.

In addition to the case of partial collapse during the treatment, previously alluded to, and which ultimately terminated in complete recovery, I am obliged by motives of honesty to record one experience in which the ultimate termination has not been entirely satisfactory.

A young woman of 22 had given birth to a child nineteen months previously. After menstruating regularly for some time she began to see her menses once every three weeks. Finally, during the four weeks preceding her visit she bled continuously and profusely. Without anesthesia, in my office, I applied the superheated steam (110° C.) for about fifteen to

twenty seconds. The cervix was packed as usual with gauze, and the patient, apparently free from evil reaction, sent home. The following day my assistant reported a mild rise of temperature with considerable pelvic pain. She was removed to the hospital, where for four weeks she was treated for a large pelvic exudate (parametritis). The bleeding was immediately controlled by the vaporization. The first succeeding menstrual flow was slightly anticipated and lasted only two days. The subsequent menses have been normal in every respect. Seven months later she still suffered from pain in the left pelvis, which I attribute to the presence of chronic salpingo-oöphoritis. My suggestion to have it operated has thus far been declined.

Although Continental writers constantly refer to the danger of cervical stenosis after the use of vaporization, I have met only one case of distinct obliteration of the external os. This good luck may be due in a measure to the fact that I use three precautions: (1) thorough dilatation of the cervix with my four-branch dilator; (2) limitation of the application to a period of time varying between five and twenty seconds, unless I deliberately decide on obliterating the uterine canal; (3) the introduction of gauze into the uterine interior at the completion of the operation.

The case of obliteration of the external os presents the following history: Mrs. G., 32, married sixteen years, was delivered of six children, the first instrumentally and the others spontaneously. The last was born four years ago. Menses always regular. Five months previous to our first meeting she thought she was two months pregnant. She began to bleed, and this kept on for two months. She was curetted by her family physician, but two months later she was still bleeding. Under anesthesia I vaporized the uterine cavity and repaired a badly lacerated cervix. After three weeks the sutures were removed and the patient discharged from the hospital as cured. Three months later she called on me to learn why her menstrual flow had not returned. I at once suspected a possible obliteration of the uterine canal. On making an examination I readily felt a thin diaphragm at the site of the external os. On forcing an opening with my finger tip there was an immediate large gush of thin, dark-colored, tarry blood. Eleven months later she reported that she was feeling perfectly well and menstruating normally.

In quite a number of cases I have vaporized the uterine cavity in conjunction with other operative procedures. Thus

my notes show simultaneous plastic work done on the cervix or perineum, removal of placental or membranous débris after abortion, morcellation and curettage for submucous fibroids, anterior and posterior colpotomy for the breaking up of pelvic adhesions or the removal of diseased appendages or adnexal tumors, vaginal fixation of the round ligaments, and Alexander's operation. In none of these cases did the additional intrauterine vaporization seem to prolong the usual period of convalescence.

For reasons evident to workers in clinics and hospitals many of these cases have been entirely lost sight of. A certain number are of too recent date to be of any value as regards permanent results. So that I command only 14 cases which have been observed over a period of time ranging between two months and a year. Of these, 2 were done for persistent and profuse leucorrheal discharge. The treatment failed in both, although one of them, after seven months, reports herself five months pregnant. The other, after a year's interval, is as bad as ever.

Of the 12 remaining cases, done for uterine hemorrhage, 11 are noted as cured. Two of these, however, required a second vaporization. The case of failure had been previously treated without success by curettage. She could not be induced to submit to a second vaporization.

I am convinced, after a year's conscientious trial, that vaporization (not vapo-cauterization) is a useful addition to our present means of combating uterine hemorrhage. The indications and contraindications still require to be definitely laid out. A careful diagnosis must be made in every case as far as possible. A case of carcinoma uteri must not be allowed to progress while trying to check irregular bleeding with the vaporizer. Similarly must the uterus be thoroughly curetted of placental and membranous débris before the vaporizer is employed.

To illustrate the necessity of thorough removal of placental débris before resorting to vaporization 1 give the following history: A young woman bled profusely for a month after a miscarriage. Under anesthesia the curette, lightly applied, seemed to prove that the uterus was empty. Vaporization at 110° C. for fifteen seconds was followed by a profuse gushing of blood. A second vaporization was followed by the same result. The finger was now introduced into the uterine cavity and a good-sized piece of placenta was found attached to the fundus of the uterus. Removing this with forceps, using the

finger as a guide, all bleeding was promptly checked. For a third time the uterus was vaporized, and into its interior a strip of gauze was passed. Three weeks later the patient reported that the bleeding was permanently checked. She complained, however, of vague pelvic pains.

With the above and other provisions I believe in the efficacy of superheated steam in controlling uterine bleedings, particularly when due to various forms of endometritis. I have not used the method for endocervicitis alone. In conjunction with curettage and other operative procedures I believe it has its place. Some operators use carbolic acid or tincture of iodine after curettage. Why not vaporization? If, after curetting the uterus after an abortion, we believe in the efficacy of a bichloride douche, why not sterilize the uterine interior instead with superheated steam?

But as a means by itself it is of unquestioned utility in controlling, regulating, or checking certain forms of uterine hemorrhage. Of this I have had a number of convincing examples during the past year. The objection that a certain proportion of these cases require a repetition of the treatment can be fairly met by remembering that the same thing may be true after curettage.

The fatal case of Treub's after puncture of the uterus was unfortunate, and undoubtedly for a time cast a shadow upon this new treatment. But who has not heard of penetration of the uterus after curettage, and in competent hands, too? In the July number of THE AMERICAN JOURNAL OF OBSTETRICS will be found the allusion to a case in which the intestine was dragged into the vagina during a curettage after abortion. The woman died. But would this induce us to discard curettage?

I agree with Dührssen, however, that vaporization should be considered as an operation, which implies proper surroundings, sufficient assistance, and surgical asepsis. I do not believe that the treatment ought to be applied to ambulant patients. Anesthesia may or may not be employed. Personally I prefer to work under anesthesia, but the patient's wishes can be consulted in ordinary cases.

I believe that the profession is in debt to Snegireff for the idea of this treatment, and to Ludwig Pincus, who has persistently devoted himself to the construction of a practicable apparatus and to the tireless dissemination of the proper manner of using it.

112 EAST SIXTY-FIRST STREET.

A CASE OF EXENCEPHALUS, WITH SPECIMEN.[1]

BY

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(With three illustrations.)

I HAVE to report a case of exencephalus. Mrs. M. M., age 18 years, healthy and well developed, was delivered of her first child December 27, 1895, after a normal labor lasting only seven hours. Vertex presentation, L. O. A. position. The child was normal in every respect and is alive and well to-day.

During her second gestation she was in bad health and suffered a great deal from neuralgia and indigestion. Her second

FIG. 1.

confinement occurred October 29, 1897, when she was delivered of this exencephalus.

Labor pains began about 2 P.M., fairly good, and about five minutes apart. An external examination showed abdomen not

[1] Read before the Milwaukee Medical Society, April 11, 1899.

as fully distended as one would expect at full term. Heart sounds not audible over front of abdomen. The pelvis, was

Fig 2.

apparently empty—that is, it did not appear to contain the fetal

Fig. 3.

head. On careful palpation the breech could be mapped out well up in the right hypochondrium. Internal examination

revealed the vagina well covered with secretions, large bag of waters protruding through the os, which was soft, thin, and dilated to about the size of a silver dollar. Passing a finger through the os, it came in contact, on the right side, with the face of the child. Made out distinctly the chin, mouth, nose, and eyes; bringing the finger forward and to the left, it passed up on the forehead and then seemed to sink into the bag of waters. The serrated edges of the cranial bones were made out, and a diagnosis of face presentation, R. M. P. position, with some abnormality of the cranial vault.

After waiting an hour another examination was made and the same conditions found, only labor had progressed considerably. The os was now fully dilated and the bag of waters nearly filled the vagina. During this examination the mem-
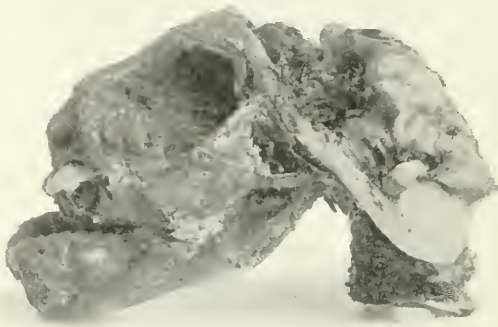
Fig. 4.

branes were ruptured and out gushed about a pint of blood and brains. The hand was then passed into the vagina, the fingers hooked around the neck, and the fetus delivered. The placenta came away in about twenty minutes, the uterus contracted nicely, and labor was at an end. The puerperium was normal in every respect.

During the early part of last June Mrs. M. M. consulted me again, saying she was afraid she was pregnant for the third time. I was glad of an opportunity to make a thorough examination, for I was anxious to ascertain if there was any pathological condition in the pelvis to account for the malformation of her second child on the theory of pressure. The examination revealed the uterus enlarged to about the size of a two-months pregnancy, but the pelvis free from anything abnormal.

She was in fairly good health during her third gestation, and was delivered January 11 last of a large, well-developed, living child.

The cuts give a very good idea of the appearance of the exencephalus when it was delivered. They were made from photographic plates taken after the fetus had been kept in a solution of formalin for more than a year, and consequently the meningo-encephalocele is much shrunken. A careful dissection was made of the whole body, and all the organs and tissues were found to be normal.

The fetus was a full-term female weighing seven and a half pounds, and, with the exception of the head and neck, fully developed. The face is well formed, the eyes protruding, the chin pushed well down on the thorax, and the neck very short, giving the appearance, as in Fig. 1, as having no neck at all.

The scalp ceases abruptly in front about the superciliary ridge of the frontal bone, on the side about one-quarter to one-half inch above the external auditory meatus, behind about opposite the spine of the first cervical vertebra. Its edges are fringed with hair, and these edges correspond very accurately with the cessation of growth of the cranial bones. Internal to the edges of the scalp the meninges pass upward, forming the constricted base and covering of the encephalocele.

The posterior view, Fig. 2, shows a dark area just above the fringe of hair, and this area corresponds in the dried skull, Fig. 4, to the space between the posterior arch of the first cervical vertebra and the basilar process of the occipital bone, the posterior half of the foramen magnum and expanded portion of the occipital bone being absent.

Treves, in his "Surgical Applied Anatomy," in speaking of these malformations says: "It is necessary to refer to the development of the skull in order to render intelligible certain conditions (for the most part those of congenital malformation) that are not infrequently met with. Speaking generally, it may be said that the base of the skull is developed in cartilage and the vault in membrane. The parts actually formed in membrane are represented in the completed skull by the frontal and parietal bones, the squamo-zygomatic part of the temporal bone, and the greater part of the expanded portion of the occipital bone.

"Among the most common of the gross malformations of the skull is the one that shows entire absence of all that part of

the cranium that is formed in membrane, while the base or cartilaginous part is more or less perfectly developed."

This condition existed in my case, the base or cartilaginous portion being developed, while the vault or membranous part was absent.

The placenta on the maternal side had become separated for about one-fifth of its circumference, and fatty degeneration had taken place in the separated part. The cord and membranes were normal.

197 FARWELL AVENUE.

EMBRYOTOMY AND TWO CESAREAN SECTIONS ON THE SAME PATIENT.

BY

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(With one illustration.)

ON the 10th of August, 1894, I was called to see Mrs. P., mulatto, age 19, then in her first pregnancy. The patient had been having rather severe pains for a considerable length of time, and, from her history, had evidently been in labor for about three days. Personal history negative, barring the fact that, according to the patient's statement, her mother was a very small woman, but, as well as she could remember, had experienced no trouble with her labors, although she had borne several children.

The patient had been married one year, and, up to the time of her present illness, had been in perfect health, having experienced no inconvenience from her pregnancy. As I now saw her for the first time, she seemed fatigued from her prolonged labor, and from the fact that she had taken little or no nourishment during the preceding seventy-two hours, as a result of which her pains were becoming less frequent and less severe in character, her pulse at this time being rather weak. The membranes had ruptured several hours prior to my visit and there was a slight bloody discharge from the vagina. Vomit-

ing had been more or less persistent during the twelve hours preceding my call.

Physical examination showed the patient to be of slight build and short in stature, her height being 4 feet 8½ inches. Heart and lungs negative. Urine contained a trace of albumin. Inspection of the abdomen showed that during a pain the uterus rolled forward, causing the organ to assume almost an antero-posterior direction.

Vaginal examination elicited a small vaginal outlet, extremely broad pubic arch, and the promontory of the sacrum readily felt with the examining finger, the examination giving one the impression of a pelvic canal contracted in all of its diameters. The cervix was flattened out and dilated to the size of a silver dollar; the child's head presenting, as nearly as could be judged, in an occipito-anterior position. The finger held in contact with the head during a pain elicited the fact that the uterine contracture exerted absolutely no effect upon the progress of the labor.

Owing to the unsanitary condition of the patient's surroundings she was transferred to the private ward of the hospital, and at 1 o'clock A.M. an attempt was made to apply the Tarnier axis-traction forceps under complete ether narcosis. After several futile efforts to engage the head, and as it was found impossible to perform a version, the child being still viable, the head was perforated, crushed with the cephalotribe, and the body delivered piecemeal; this part of the operation occupying one and a half hours. Owing to the extremely small vaginal outlet, and the fact that to extract the fragments traction had to be exerted well backward, the perineum was completely torn, the tear extending two and a half inches into the rectum.

The placenta was adherent and it was necessary to remove it piece by piece; after the last portion of the placental tissue had been removed the cavity of the uterus was thoroughly curetted with a dull irrigating curette, this being followed by

a thorough flushing of the cavity of the uterus with hot steril-ized water. Bleeding having largely subsided from the uterus, the upper portion of the vagina and rectum was packed with iodoform gauze and the tissues below cleansed with sterilized water. The tear in the recto-vaginal septum was closed with interrupted sutures of fine silk, the separated ends of the sphincter ani muscle brought together by means of a deep silk-worm-gut suture, and finally the perineum repaired; during the operation a stream of sterilized water being played con-stantly upon the parts. The recto-vaginal tear healed perfectly, and the sutures were removed on the tenth day. The patient urinated twelve hours after the operation and recovery was uneventful, the patient going home at the end of the third week. Time occupied in delivering the child and repairing the damage done to the parts was about three hours.

On the 15th of June, 1895, I was again called to see the patient and found that labor had just started, she being then at full term. Vaginal examination showed the head wedged in about the same position as at the preceding labor and making no progress. With the experience of the preceding year fresh in mind, coupled with the fact that the parents expressed the desire that every effort should be made to save the life of the child, Cesarean section was advised, the only restriction placed by the family being that none of the organs should be removed at the time of the operation unless it was found absolutely necessary.

The patient was again removed to the private ward of the hospital and a careful external measurement of the pelvis taken, with the following results: distance between the ante-rior superior spines of the ilia, $7\frac{1}{2}$ inches; distance between the crests of ilia, $8\frac{3}{4}$ inches; sacro-pubic, 5 inches; width of pubic arch at articulation, $2\frac{1}{4}$ inches.

The pains not being severe or frequent and the fetal heart sounds good, the patient was given a half-ounce of magnesium sulphate, which was followed in three hours by a high enema of water. The following morning another high enema was given, which caused a free evacuation of the bowels. The patient was then prepared in the customary manner for laparatomy.

Operation June 16 at 10 A.M. Median incision extending three inches above the umbilicus. The uterus was lifted out of the abdominal wound, wrapped in hot wet towels, and firmly held by an assistant. Two sutures of silkworm gut

were then passed through the entire thickness of the abdominal wall above the uterus, which, when tied, closed the wound in the abdomen above the uterus, thus preventing any undue exposure of the peritoneal cavity. An elastic ligature was then placed about the cervical portion of the uterus, and the uterus opened in the median line anteriorly, the incision extending close to the fundus of the uterus. There was but little bleeding from the uterine incision. As soon as the uterus was opened the membranes presented; these were ruptured and the amniotic fluid allowed to escape.

The placenta was situated on the anterior surface of the uterus, at the junction of its upper and middle thirds, and was directly under the line of incision; it was rapidly separated from the uterus by the hand and delivered; the feet of the child were then grasped and it quickly delivered, an assistant gently kneading the uterus during this time. The uterus was then washed out thoroughly with hot sterilized water and its cavity swabbed with 1 : 40 carbolic solution. Just as soon as the hot water came in contact with the uterus the organ contracted.

In removing the child, which was a male weighing 8½ pounds, the uterine wall was slightly torn at its upper portion, the tear being at right angles to the incision.

The next step consisted in the closure of the uterine wound, which was accomplished by using interrupted sutures of fine silk placed at intervals of about a quarter of an inch, these sutures entering at the edge of the peritoneal surface of the uterus and passing down to the endometrium. The peritoneal surface was approximated with interrupted sutures of catgut and the abdominal wall closed with through-and-through sutures of silkworm gut.

Time occupied by the entire operation, one hour and ten minutes. The child was put to the breast at the end of twelve hours. The sutures in the abdominal wall were removed on the eighth day, the patient leaving the hospital on the twenty-first day, convalescence being no longer than after the embryotomy. At no time after the operation did the patient have a temperature over 99° F.

Six months later the mother consulted me for a slight discharge from the lower portion of the abdominal wound. The discharge resembled that commonly found in endometritis, and upon further examination I found that a probe could be readily passed through the abdominal fistula and entered the

cavity of the uterus. The opinion formed at this time was abundantly confirmed when seven months later—two months after weaning her child—the patient noticed a bloody discharge from the abdominal sinus, which was coincident with that of her menstrual period. This bloody discharge from the abdominal sinus appeared with each recurring menstrual period, and was much brighter in color than that which passed the vagina. An interesting feature of this complication was the fact that the bloody discharge from the sinus usually made its appearance about a day earlier than that from the vagina. Operation for this was advised, but declined.

On the 15th of April, 1898, the patient again called to see me, stating that she had missed her February and March periods. The discharge from the abdominal sinus had ceased with the disappearance of the menstrual periods. From this time on until full term the case was examined frequently, and it was decided to resort to operation either prior to the onset of labor or at its first appearance.

On November 12, being one week over the time allowed for the full term of pregnancy, and there still being no signs of labor, operation was decided upon, the family leaving to my judgment the character and extent of the operation. The patient was once more removed to the private ward of the hospital, and, after the usual preparations, the abdominal incision was made just to the right of the old cicatrix, when the following rather interesting conditions were found:

1. At the point of the sinus in the abdominal wall the uterus was intimately adherent to the wall of the abdomen over a space of $2\frac{1}{2}$ inches.

2. On either side of the old scar in the anterior wall of the uterus were bands of adhesions extending along the entire length of the organ and across its cervical portion. The adhesions thus formed completely surrounded the field of operation, save at the fundus of the uterus, where they were deficient; uniting as they did the anterior surface of the uterus to the parietal peritoneum, they made the operative field practically extraperitoneal.

3. The cicatricial tissue about the sinus in the uterus extended over an area $1\frac{1}{2}$ inches in diameter.

Under these conditions the uterus was not drawn out through the abdominal wound, as was done at the preceding operation, neither was an elastic ligature placed about the cervical portion of the organ.

The incision in the uterus was made along the line of the old wound, no trace of the silk sutures introduced at the time of the previous operation being observed. It was noticed that there was slightly more bleeding from the uterine incision than occurred when the elastic ligature was used.

The membranes were ruptured and the placenta found to be attached at about the same point as before, perhaps a trifle lower, and was delivered as at the preceding operation. The child, a female weighing $7\frac{3}{4}$ pounds, was then grasped by the feet and quickly delivered.

Owing to the adhesions along the sides of the uterus, supplemented by gauze packing above, where the adhesions were deficient, thus far the operation was practically extraperitoneal.

At the point of the fistulous tract in the uterine wall the cicatricial tissue was excised and the opening in the uterus closed, the closure differing from that in the previous operation in that the interrupted sutures of fine silk entered on the peritoneal surface of the uterus, a short distance from the edge of the incision, and were placed a trifle closer together, the superficial suture of catgut being omitted.

Both tubes and ovaries were then removed, a wedge shape of uterine tissue being included in the uterine end of each tube. The bases of these triangular spaces were then closed with deep sutures of catgut, the only suture material used in the removal of the tubes being catgut. The cicatricial tissue in the abdominal wall was next excised and the wound closed with tier sutures, the muscles being approximated with three mattress sutures of silver wire, and the closure of the wound completed with a subcuticular suture of catgut. The time from the abdominal incision to the delivery of the child was nine minutes, and the operations were completed in one hour. Recovery was uneventful, the mother and child going home at the end of the fourth week.

In the house to which the patient went there developed a case of diphtheria. The mother and child contracted the disease, the child succumbing to the malady, while the mother, after a rather tedious convalescence, recovered, and is to-day, with the child delivered at the first Cesarean section, in perfect health.

The question might be raised in this case as to the relative value of symphyseotomy and the more serious operation of Cesarean section, or whether embryotomy might have again

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been performed. With symphyseotomy I have had no personal experience, and yet I am inclined to believe that the mere separation of the pubes would not have allowed the passage of the child in this individual case.

The external measurements of the pelvis in this case were no less than one would expect to find in a woman the stature and build of this patient, and yet the conjugata vera was, owing to the extremely wide pubic arch and the unusually marked sacral prominence, contracted. This fact, coupled with the difficulty in removing the child, even piecemeal, at the first labor, and the fact that the parents desired a living child, seemed to justify the course pursued.

While the external measurements of the pelvis may prove of great value to us in determining beforehand the probabilities of a severe or easy labor, yet at the same time we must take into consideration the size of the child, which can be but approximately determined. Consequently any rules laid down as indications for the operation can be but relative, and we are left to determine in each case whether the pelvic canal is of sufficient size to admit of the passage of the child.

Given a case which has been subjected to the operation of embryotomy, as was this case, with the extreme difficulty experienced in removing the macerated child, I am inclined to believe that the Sänger Cesarean operation, performed in a healthy woman before her resisting powers have been lowered by a prolonged labor, is, under favorable surgical conditions, fraught with well-nigh if not quite as little danger to the mother as the so-called more conservative procedure of embryotomy.

In my own case the woman was about and attending to her customary duties nearly as soon as she would have been after a normal labor. When I compare the severe ordeal to which the patient was subjected at the first operation with either of the subsequent operations, the latter was far less severe, and in both instances the patient was left in better condition than she was after the embryotomy. The Porro operation was not resorted to because in this case the uterus was in a healthy condition, as were also the appendages.

The removal of the uterus must of necessity add to the dangers of a Cesarean section, and unless there be distinct and definite reasons, such as morbid growths in the uterus or a septic condition of the organ or appendages, it would seem to

me that we can best conserve the after-welfare of the patient by not removing the organ.

In my own case I regret that in place of the double salpingo-oöphorectomy I did not follow the course pursued by Crimail, of Pontoise, in which, during the second Cesarean section upon the same patient, in order to provide against subsequent pregnancies, he passed a double ligature about the uterine end of each tube and divided the tube between the ligatures. Such a course, by allowing the ovaries to remain, would tend to relieve the patient of the various nervous phenomena incident to the artificially-produced menopause.

Too much stress cannot be laid upon the careful and methodical closure of the uterus. While time is an important factor, yet I am inclined to believe that in my first Cesarean the fistulous tract might have been due to the fact that the sutures were not placed quite closely enough together. In the subsequent operation the sutures were placed at shorter intervals and no superficial sutures of catgut used.

CORRESPONDENCE.

THE APRON METHOD OF TREATING COMPLETE TEAR OF THE PERINEUM.

To the Editor of The American Journal of Obstetrics. etc.

Dear Sir:—Will you not kindly include in your next issue an omission I thought I had supplied in my article, and one which does not occur in my statement in the *Medical News* of proximal issue?

I find, through the kindness of Dr. Chadwick, that Dr. Warren has some time since described the apron method of treating complete tears, and I desire to accord him full credit.

Sincerely yours,

Howard A. Kelly.

1418 Eutaw place, Baltimore.
September 8, 1899.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of June 2, 1899.

Vice-President J. WESLEY BOVÉE, M.D., *in the Chair.*

DR. J. THOMAS KELLEY, JR., showed

A BLOOD CYST OF THE OVARY AND TUBE FILLED WITH FLUID.

The other ovary had a peculiar appearance, as though it might be malignant. The tube was filled with fluid and was adherent. He said he showed the specimens to bring out the point of so-called conservative surgery. His intention had been to leave the second ovary, but, seeing the malignant appearance, he decided to remove it, and asked the opinion of the Society as to its malignancy, judging from its gross appearance.

DR. J. WESLEY BOVÉE presented a specimen of

DERMOID CYST OF THE OVARY

removed from a colored girl 17 years of age. She had been seen a year before by Dr. Ryon, of Bowie, Maryland, who found she had an enlargement of the abdomen corresponding to about four-months pregnancy, and did not examine her carefully. thinking she was pregnant. Being asked to see her again in April, he found the growth slightly larger and sent her to Providence Hospital. The growth was then filling the pelvis and abdomen to above the umbilicus. April 12 he removed the growth by abdominal section and found it to be a dermoid of the right ovary with its pedicle twisted one and a half times. The opposite ovary being large and cystic, the body of the uterus and the appendages were removed. Previous to opening the growth he felt a hard substance in it that was considered bone, but on opening the sac he was disappointed in not finding hair or sebaceous matter, but instead a considerable quantity of brown, thin fluid and a rather large amount of blood clot, probably the result of hemorrhage into the sac from the twisting of the pedicle. Dr. Carroll, in examining the specimen more carefully, found in the wall, but separate from the sac cavity, a small cyst containing hair and a piece of bone, connected with which was a very sharp single-pointed root of a tooth. Besides this there was an ounce of thin, yellowish, semi-opaque, oily-looking fluid, which completed the diagnosis.

Dr. Bovée also presented a specimen of

MULTIPLE FIBROMATA UTERI AND AN OVARIAN CYST

removed from a colored woman.   This woman, 34 years of age, had had but one pregnancy, which ended in normal labor, thirteen years ago.   Operation April 29, 1899, removing a mass of fibroids extending to three inches above the umbilicus, and a cyst of the right ovary containing about six ounces of clear fluid.   When the abdomen was opened he found stretched across the whole front of the abdomen, and intimately adherent to the tumor, the omentum containing fully three dozen large veins, some of which were nearly a half-inch in diameter. This was ligated off in sections with catgut, exposing a badly adherent fibroid fully as large as an adult head and attached to the uterus by a pedicle about one inch by half an inch, which upon being severed bled but very little, showing the tumor was relying almost entirely on the omentum for its blood supply, and no doubt would soon have been completely separated from the uterus.   When this was removed a large, ragged uterus extensively adherent to the intestine, and a fibroid, four inches in diameter, between its left tube and round ligament, were revealed, while still below them was an ovarian cyst, as mentioned, adherent on all sides.   Removed the appendages and the uterus except the cervix.   Catgut was the only suture material used, and three quarts of hot salt solution were left in the abdomen.   The operation lasted two hours and ten minutes, and a remarkable feature was that, though the operation was severe and chloroform was the anesthetic employed, the pulse, 81 at the beginning, was but 83 at the finish.   Another interesting feature was the existence of a simple ovarian cyst in a colored woman, which is recognized as being one of the rarest things in pathology.

Dr. Bovée said, in regard to Dr. Kelley's specimens, that the ovary containing the blood cyst should certainly be removed.   It showed a diseased condition of the blood vessels, and if only the *cyst* were removed it would have returned. There was a close relation in this condition to malignancy. Dr. Mary Dixon Jones had written considerable on the subject. The speaker had read a paper before the Southern Gynecological Society and shown a specimen.   He claimed in the paper that they were often mistaken for ectopic pregnancy.   In his specimen the microscope showed no evidence of pregnancy. These cysts often caused infection and peritonitis.   Dr. Bovée referred to Scanzoni's celebrated case occurring in a young prostitute.   He was unable to say whether the other specimen should have been removed.   The operator was best able to judge; if any trouble is expected by allowing it to remain, it should be removed.

Dr. J. Wesley Bovée read a paper entitled

THE USE OF GLOVES IN ABDOMINAL SURGERY.[1]

DR. ARTHUR SNYDER said he had never used gloves in surgery, but he had used finger tips, which he found rather disagreeable. He thought bone surgery would present difficulties making gloves impracticable.

DR. JOHN VAN RENSSELAER said, although he had no experience with gloves, he readily saw it was a great advance, especially if the gloves were made well and allowed manual dexterity.

DR. BAYNE said all surgeons were interested in anything that would make the operator and patient as aseptic as possible. Of all gloves he thought the impermeable rubber gloves the best. They probably interfered somewhat with tying ligatures, sewing, etc.

DR. KOBER said he was glad Dr. Bovée had spoken of aseptic methods in contradistinction to antiseptic methods. There were certain organisms floating in the atmosphere, therefore the air should be disturbed as little as possible. The walls should be tiled, and washed with antiseptic solution.

DR. BORDEN said he had used gloves several times. There was a diminished sense of touch at first, but after using them several times he was surprised to see how easily adhesions were separated with the guarded finger. The lessened tactile ability was certainly not so great as the lessened chance of infection. The cleanliness of the bare hands was only relative; they might be perfectly clean at one stage of the operation and be infected a few minutes later. Dr. Borden thought gloves a decided advance in technique.

DR. I. S. STONE said it was for a certain sense of self-protection that he used gloves a year ago. He thought Halsted was the first to use them, and after published results at Johns Hopkins he did not think the hands could be made sterile. In all their investigations, only the hands of one, a nurse, were found clean. His teaching had been soap, water, and scrubbing brush, and he had seen good results; but even if our hands were sterile, we were never sure of those of the assistants and nurses. Lister reported the atmosphere to contain germs and used a spray. Formalin had been used for sterilizing instruments, and he saw no reason why it should not be used for gloves, though heat should be relied upon wherever practical rather than chemicals. Dr. Stone recited the dress of a physician during the plague of 1640. He was encased in leather and breathed through a layer of aromatics. He carried a long wand with which to feel the pulse. Dr. Stone had almost no embarrassment in using gloves; a puncture was not important. Gloves would ordinarily last for six or eight operations. He had had no infection of himself since using them. Some had an idea that the thick gloves used in a postmortem were the kind referred to as being used by surgeons, but the

[1] See original article, p. 491.

gloves used were thin. Sometimes the gloves might have to be laid aside during a long operation.

DR. HICKLING said first of importance was the preparation of the operating room; if carefully prepared by formaldehyde gas there need be little fear of infection from this source. He had used it extensively at the Asylum Hospital. In the use of alcohol and bichloride of mercury it was necessary that they be used separately if good results were expected—first the mercury salt and then the alcohol. He had had no extended experience with gloves; the sense of touch he found very little embarrassed.

DR. J. WESLEY BOVÉE said gloves could be obtained from the Miller Rubber Company, of Ohio, for fifteen dollars per dozen pairs, made from a mould to accurately fit the hands. He had, owing to a small sore on the back of his hand, done a vaginal hysterectomy and had found no difficulty. It was claimed that the best results from gloves had been gotten in bone surgery. At the present time in operating everything was brought to sight, so that the little diminished tactile sensibility made very little difference. The gloves should be made to fit the hands well.

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Meeting of June 16, 1899.

The President, THOMAS C. SMITH, M.D., *in the Chair.*

DR. I. S. STONE presented the following specimens:

I. A MULTINODULAR MYOMA

removed from a negress, which presented myriads of small growths of various shapes. The operation was not difficult, and the aggregation of small tumors would not weigh over four pounds, yet the patient died of unforeseen causes, one of which was an old appendicitis which favored a bowel obstruction which proved fatal on the third day after operation. The severe symptoms set in on the evening of the second day and appeared to indicate shock. She had rapid pulse, subnormal temperature, and other symptoms of shock or hemorrhage. At the autopsy the only cause found for the obstruction was a long, adherent appendix, which had displaced the caput coli upward, the result of an appendicitis. Besides this the patient had fatty liver and atheromatous coronary arteries. The woman had no apparent power of resistance. She was about 45 years of age, lost but little blood at the time of operation, and had no peritonitis or defect in technique shown at autopsy. Dr. Stone had lost no case of supravaginal hysterectomy since two had died of embolism, having a long run of consecutive successful cases.

II. A MYOFIBROMA OF THE UTERUS,

removed two days previously, which presented both subperitoneal and intrauterine growth. The patient was a nearly white

woman of 40, whose health had been fairly good until the growth was discovered, more than two years since. She had borne several children. The patient had been treated by her physician for severe hemorrhages, and on this account had been referred to the reporter for operation. A sloughing fibroid was found distending the os uteri which appeared to be about the size of a small orange. The operation was not unusually difficult save in one particular. The uterine cavity being filled with pus, it was almost impossible to avoid contamination of the wound. He was positively sure that the peritoneum was kept clean, however, and the patient thus far had no rise of pulse or temperature and would undoubtedly recover. The reporter made especial mention of this case because it was taught by some that such intrauterine growths should be removed by the vaginal route. He had seen severe and occasionally fatal sepsis follow such surgery. We have here a condition favoring sepsis, and to have removed the intrauterine growth in the presence of other myomata, as in the present case, would appear to invite disaster. The specimen was a good illustration of both subperitoneal and submucous myomata and weighed nearly seven pounds.

III. A SPLEEN WITH A PORTION OF ITS MESENTERY CONTAINING LARGE VEINS FILLED WITH BLOOD CLOT.

The patient, a lady of about 35 years of age, had formerly undergone unilateral salpingo-oöphorectomy, October 11, 1893. At this time it was discovered that her spleen reached the pelvis and lay in Douglas' cul-de-sac, back of her uterus. It was thought best at that time not to remove the spleen, as she had no inconvenience whatever from its misplacement, as it was not much if at all enlarged. Some weeks ago, however, she was taken suddenly ill with severe pain in the abdomen, and a tumor was found by her physician, which proved to be the greatly enlarged spleen. The patient entered Columbia Hospital suffering from symptoms of acute peritonitis associated with considerable swelling and pain over the left side and lower abdominal aspect. Owing to the presence of an acute bronchitis, the operation was deferred until she appeared to be in fairly good condition.

Operation.—The spleen was reached through a median incision, and without great difficulty was removed, although it was adherent to everything with which it was in contact. The omentum was first separated and afterward the intestinal and mesenteric surfaces. The color of the organ is very dark and a portion of it quite soft. It was twisted upon itself six times. The splenic artery was occluded by the twisting of the pedicle, and all the veins in the adjoining mesentery enormously distended with coagulated blood. Very much of this was necessarily allowed to remain, but no complications have arisen from so doing. Only one vessel, the gastro-epiploica sinistra, required a silk ligature; catgut was used throughout the operation, with

this exception. The specimen weighed two pounds eleven ounces after some days' immersion in a preservative fluid. The patient had never had a symptom of any kind referable to her spleen until the accident (torsion) occurred. The same may be said of her since the operation, for she is well and in good condition generally, although she is, and has been for years, a neurotic. Her blood, prior to operation, had an excess of leucocytes (leucocytosis), but she has had no malaria for several years, and there was no suspicion of leukemia.

Dr. J. Wesley Bovée presented the specimens and case histories of

TWO CASES OF RUPTURED TUBAL PREGNANCY AT THE THIRD MONTH,

operated the same day, and in which both the fetuses were found. The first case had been admitted to his service in Columbia Hospital June 4, 1899, in a very serious condition. Her pulse was 150, temperature 101.4°, the abdomen exceedingly distended, and vomiting constant, nearly. He saw her a few minutes later, and, as the history was unreliable, he attempted to relieve her condition by purgative enemata and calomel, notwithstanding she said she had been suffering with profuse diarrhea for the past few days. During the morning of the next day her bowels moved several times, and the idea of intestinal obstruction was removed. At this time she was improved, and the following history was secured from her:

Parents and eleven brothers and sisters living and well; a brother died of intestinal obstruction and another of consumption, besides four in infancy. She is colored, 29 years of age, married; has had three children, the last in 1891, and no miscarriages. In her second labor there was a coiled funis, and in the last a midwife is said to have performed version. The last menses appeared the latter part of February. About the 4th of May last, felt a sharp pain in the rectum, radiating to the abdomen, with nausea and frequent vomiting; was confined to bed several days; constipated, but without fever. A week later had a recurrence of equal severity and was confined to bed for a few days. June 1, a third attack began by severe pain in the rectum, but more severe than previously and accompanied with considerable vomiting. Since that date has been unable to retain nourishment and the pain has been more severe; has had pain in hypogastrium and retention of urine eight to ten hours at a time. An ambulance case. An examination showed the abdomen below umbilicus to be distended by a hard mass, the upper edge of which curved downward and outward on both sides from the umbilicus. The distension was enormous and the appearance of the patient was that of impending dissolution. She gradually improved, her temperature in four days reaching 99° (but never lower) and the pulse to 90. On leaving the city, the 5th, she was left in charge of

Dr. Stone, who kindly looked after her as well as the other of these cases. A few days after admission she passed a very fine specimen of uterine decidua. On the 12th he operated through the abdomen, permitting a large amount of tarry blood to escape. There was found a large mass, recognized as a right ruptured tubal pregnancy, which was removed without the normal ovary of the same side. The other appendage was also left for the same reason. A three-months fetus was found among coils of intestine, to which it was adherent on all sides except the very top of the head. It nearly escaped his notice, owing to its resemblance, both in size and shape, to the loops of intestine with it. It was separated from them and found to have retained about four inches of the umbilical cord. The abdominal cavity was carefully wiped out, but not completely, as many clots had become too intimately attached to the peritoneum for safe removal. The abdomen was closed, and thus far her recovery is perfectly satisfactory.

In this case the tube has two openings, one of which admits readily two fingers, while the other is not quite half as large. The fimbriæ show very prettily on the surface of the large tubal mass as does the uterine end of the tube. In this case the history of last menses occurring the latter part of February and the first evidence of rupture the 4th of May would indicate that rupture really occurred at the latter date. Presumably this occurred, but the size of the fetus and of the tube, the size of the large rent in the tube, and the very limited extent of absorption of the fetus, which so early in fetal development we know is so rapid, suggests to him that development of the fetal structures was cut off at some later date, say June 1, which may account for these points.

The second case was in a woman 36 years of age and also colored, and who was admitted to Columbia Hospital May 26, 1899. She had had two children (forceps delivery), the last eight years ago, and two miscarriages, the last of which was eighteen months ago and from over-exertion. Tubercular family history. Her last menses occurred the latter part of February, and during March and a part of April she had a profuse, whitish-red discharge. One week before admission she passed something that looked like flesh, followed by clots and bearing-down pains; since then she has had a bloody discharge and very severe pains; has been ill about four weeks. On admission her pulse was 102 and the temperature 99.7°, and she did not appear very ill. For the next five days she had occasional severe pain, but he could not find a decided mass in the pelvis, and the diagnosis was not yet made, though some form of infection, perhaps from criminal abortion, was considered the probable cause of the trouble.

About the 2d of June an examination revealed a mass of unknown character, probably inflammatory, above the uterus and on both sides. The two cases, however, were so nearly alike, and the history of the first so typical, even before shedding of the decidua, that this was also considered ruptured tubal pregnancy. On the morning of the 4th of June

her pulse suddenly jumped to 128, but with no change in temperature, and that evening returned to 96. Her temperature now began to take an upward turn. She was left with Dr. Stone, who did not feel advised to operate at once. He planned to operate on the 10th, but, learning I was to then return, he countermanded the order for her preparation. which he regretted on learning that morning she was worse. Her temperature ran up the 10th to 103.5°. and the pulse as well ascended in rapidity, and on the 11th it was the same. When the operation was begun the pulse was 120 and feeble, but it seemed advisable to give what seemed the only chance for life. The fetus and placenta were found outside the tube in the peritoneal cavity and in a large amount of blood clot, both light and black; both fetus and placenta seemed fresh and growing. the fetus being of about the same size as the other specimen removed. The left tube was enlarged in its outer half, and on one side split down from the fimbriæ for the distance of fully an inch, and the remainder of the enlarged cavity was a small basin apparently shut off from the lumen of the remainder of the tube by a newly formed membrane. A silkworm-gut suture was easily run from the uterine end of the tube up to this new membrane and, when it was incised, on through the basin mentioned. A right pus tube and ovarian abscess were prominently present, and he removed them. Considerable oozing in the pelvis very much delayed the operation, and the patient could not withstand the shock, dying a few minutes later.

Dr. Bovée has operated for ruptured tubal pregnancy about thirty times, and in some but a few hours after rupture; but in cases of rupture of the tube in the early months he has never before been able to find the fetus, and it so happens that he finds it in two cases in one day, both about three months. In one the fetus and placenta are both expelled from the tube and seem perfectly fresh, while in the other Nature demonstrates her method of disposition of such structures placed in contact with the peritoneum. He regrets the failure to diagnose the last case earlier, as an operation done shortly after admission would have been more hopeful. Perhaps the diseased appendage of the opposite side might better have been left, but it was so large and seemed so dangerous that it was removed.

He presented these two specimens because of the interesting points connected with them—first, the decidua and fetus. the tube mass, and the attempt at absorption from the first: second, the peculiar slit in the tube in the second case; third, the presence of a considerable quantity of pus in the appendage of the opposite side; and, lastly, the finding of two such specimens in one day, the first time in his experience.

Dr. Bovée also presented specimens of

ABSCESSES OF FALLOPIAN TUBES AND OVARIES

from two cases, the first of which were removed June 15 from a young woman about three months after marriage to a man who had occasionally "strained himself" in intercourse during

the past few years. His last attack was eight months before marriage and the urethral discharge lasted but one week. The woman was probably infected by the husband. Both tubes found markedly distended with pus, and the right ovary was the size of an orange, distended by septic fluid consisting of blood and pus. The left ovary, badly adherent, was firmly agglutinated to the fimbriæ of the tube, and, as the latter structure was distended with pus, it was deemed best to remove the ovary. The vermiform appendix, which had been giving her great trouble also during the past week, was found much enlarged, considerably distended, and adherent to the right tube and the anterior wall of the rectum; this was also removed and all suturing done with catgut.

The other case, also done on June 15, was one of double pus tubes and diseased ovaries, the left one being the size of an orange. In this case the adhesions were far more difficult to separate, and demonstrated well that the use of rubber gloves in such surgery does not handicap the operator. This case is an instance of the old pus case, while the first one is of the acute kind. In the recent one the patient did not complain of any trouble previous to her menstrual period in early May. Then, contrary to her habit, she suffered much pain, though no delay was noticed. The flow was freer than usual, but nothing indicated pregnancy. After this period she was constantly suffering with severe pelvic pain and would remain in bed occasionally for a day. An examination at this time revealed large masses on either side of the uterus, with excessive tenderness in the region of the cecum. These points are mentioned particularly, as in a number of cases of gonorrheal infection it seemed to date from a menstrual period, and he believes the exfoliation of the epithelium at this time furnishes an excellent opportunity for the propagation of the gonococcus and extension of its invasion.

DR. E. L. TOMPKINS read a paper on

NIGHT-TERRORS.[1]

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of March 1, 1899.

The President, MR. ALBAN DORAN, in the Chair.

PRESIDENT'S INAUGURAL ADDRESS.

The President began the address by showing how the Obstetrical Society of London had from its earliest days taken the

[1] See original article, p. 485.

deepest interest in gynecology, now a well-established specialty, which had rendered important services to general surgery. Uterine therapeutics and minor gynecology were associated with abuses, but so were medicine and surgery. They were indispensable and must be well understood, because, as in the case of the abscess knife and the catheter, "minor" proceedings with the curette, the sound, and other special instruments were liable to cause grave damage if unskilfully performed. The President especially dwelt on the judgment of gynecological surgery on general surgical grounds, and insisted that good operating was not always good surgery. Plastic surgery had made great advances since 1859. Vaginal hysterectomy for cancer seemed to be good surgery as compared with the cancer practice of the general surgeon. Ovariotomy proved the key to modern peritoneal surgery. Drainage and flushing of the peritoneum were intimately associated with it; the latter, in turn, was closely related to transfusion as now understood. In operations for diseases of the appendages due to inflammation a skilful and successful operation might be decidedly bad surgery, or else questionable surgery, or else very good surgery. Exploratory incision was often needed in chronic cases; sometimes it was sufficient to liberate the ovaries and tube from the painful bondage of adhesions; sometimes only one tube and ovary needed ablation. On the other hand, bilateral suppuration of obstructed tubes of course demanded removal of both. Bad after-results chiefly arose from the pedicle, the tissues of which were often unhealthy, and not from the uterus. In reporting a series of these cases a long after-history was needed. Foreign authorities were very careless about this matter; thus, one operator publishes tables where eight operations were performed within six weeks of the reading of the paper. They seem also far too ready to remove the uterus with the diseased appendages. One operator, living in a relatively small capital, has performed this operation over five hundred times in a very few years. His mortality was low, but no reliable after-histories were given. Recovery in this class of operations was, for obvious reasons, no proof that the removal of the parts was necessary, while in bad cases, where the operation was good surgery, the results were not always entirely satisfactory. The removal of ovaries for neuroses was almost universally condemned. Weir Mitchell had categorically declared that the whole principle of such a proceeding was wrong. The surgery of uterine fibroids had greatly progressed, but much more had to be learned. Fibroids of the broad ligament needed early removal; so did uterine fibroid in a very young subject, or in a case near the menopause where there was rapid increase of growth and manifest softening. When in doubt the surgeon should always wait; bleeding and slowly growing fibroids allowed of watching and palliatives. Speculative operations, where the fibroid was small and caused neither severe hemorrhage nor pressure symptoms, were not good surgery. In the field of uterine displacements there were many abuses. A long series of operations had been devised to

fix the uterus up in its right place or to support it from below. The variations in opinion and practice showed that much remained to be settled. The President thought that even the pathology of displacements was yet obscure, nor did certain operations overcome the essential morbid condition associated with a flexion or version. Hysteropexy in well-selected cases was beneficial, but, as in operations for chronic disease of the appendages, long after-histories were needed, but were not always furnished in papers written by operators. Surgery must respectfully follow clinical exploration; otherwise not only the surgeon's knife but his power of diagnosis would be blunted by too many exploratory incisions. Patient clinical research was the sheet anchor of the gynecological surgeon, and surgical proceedings were only justified when clinical research had proved that there was something which ought to be removed or rectified by an operation.

DR. HUBERT ROBERTS read a paper on a

SECOND CASE OF PRIMARY CARCINOMA OF THE FALLOPIAN TUBE.

The case occurred in a married lady, æt. 60, never pregnant. No history of pelvic trouble. The menopause occurred at the age of 50. She was perfectly well up to June 27, 1897, then first noticed a cherry-colored watery discharge lasting three days. Nothing was noted on vaginal examination. July 30, 1897: Discharge recurred and was more profuse, but of the same character. lasting two days. September, 1897: Very severe abdominal pain; this was followed by another rush of watery fluid. Repeated pelvic and abdominal examinations during the latter months of 1897 revealed no tumor. In the spring of 1898 a fourth attack of watery discharge and severe pain. April 3, 1898: A swelling was first discovered behind and to the left of the uterus. Subsequent examination at the end of April confirmed the presence of a tumor which had grown rapidly, and the preliminary diagnosis of a malignant ovarian tumor was made.

Operation, May 5, 1898. Abdominal section. Tumor proved to be an enlarged Fallopian tube filled with growth. The operation was one of great difficulty owing to many adhesions, and the tube ruptured during the operation. The ovary on the same side was cystic, but not infiltrated with growth. The appendages on the other side were healthy. There was no secondary growth or infiltration of the pelvis at the time of operation, nor any free peritoneal fluid. The patient recovered from the operation. In November, 1898, a favorable report was received of the patient's condition ; but early in January, 1899, the patient was not so well, and examination proved that there was already well-marked recurrence of malignant growth in the pelvis.

THE PRESIDENT remarked that carcinoma of the tube cer-

tainly arose from papilloma such as occasionally developed in an old hydrosalpinx. Dr. Roberts' case seemed to be of that type. In the tables which he himself had prepared (Obst. Transactions, 1898), the patient was 60 years old in two out of a total of 25 cases, and between 58 and 59 in two more. He thought Doléris was correct in distinguishing an endosalpingitic papilloma, and had himself demonstrated the relation of papilloma to inflammation as long ago as 1879, and noted the malignant degeneration of papilloma in 1888. He had recently come across a case of papilloma of the tube associated with malignant tumor of the broad ligament. He doubted whether cancer had ever been seen to develop in a previously healthy tube.

DR. CULLINGWORTH said that the question as to the connection between papilloma and carcinoma could scarcely be settled until an opportunity occurred of examining a carcinomatous tube at an early stage. He (the speaker), notwithstanding that he had had a fairly large experience in tubal affections, had not as yet happened to meet with a single example.

DR. AMAND ROUTH alluded to a case of primary carcinoma of the Fallopian tube which he had reported to this Society. He doubted whether these cases began with papilloma, the microscopic sections showing nothing in common with the forms of malignant papilloma which he had seen invading the uterine wall.

DR. ROBERTS said he had not been able to find any case recorded below the age of 36. He believed the pain to be due to the distension of the tube by fluid, which, when the tension rose above a certain limit, escaped as a cherry-colored discharge. Dr. Roberts thought it quite possible that the case started in an old hydrosalpinx, though there was nothing in the previous history to show this. It was very difficult, if not impossible, to distinguish between papilloma and carcinoma of the tube.

The following specimens were shown: DR. SMYLIE (Dublin): Three myomatous uteri removed per vaginam by Doyen's method. MR. BLAND SUTTON: (1) A ruptured ovarian tumor; (2) An acardiac calf. MR. A. LIONEL SMITH: An infant showing diffused subcutaneous induration. DR. DAKIN: A fibromyoma spontaneously enucleated during labor.

Meeting of April 5, 1899.

The President, MR. ALBAN DORAN, in the Chair.

DR. GRIFFITH and DR. EDEN read notes of a

CASE OF PUERPERAL ECLAMPSIA,

with a description of a five weeks' ovum removed in a subsequent pregnancy.

A married lady, age 32, suffered from eclampsia at about the seventh or eighth month of her third pregnancy. Labor was induced by Dr. Griffith with the intrauterine bougie, and she

recovered. About eighteen months afterward she again became pregnant. and severe symptoms ensued as early as the fifth week. Dr. Archibald Garrod reported that there was evidence in the urine of chronic nephritis, and the uterus was therefore dilated by the rapid method and the ovum removed. The symptoms thereupon rapidly disappeared, but a trace of albumin persisted in the urine for some time.

The ovum removed was in naked-eye appearances healthy, but showed certain microscopic changes, which are described. It is shown that the fetus had survived up to, or within a very short time of. the removal of the ovum: the changes described are, therefore, primary, and are probably due either to a pre-existing unhealthy condition of the endometrium or to malnutrition following upon an unhealthy state of the maternal blood, associated with chronic nephritis.

The President observed that a great deal had been written recently on eclampsia; the source of the disease and its treatment had been much disputed. Winkler insisted that it always arose from renal disease in the mother. Hoffmann traced it to toxemia from carbamide of ammonium. Baron and Castaigne declared that it arose from toxic elements developed in the living fetus, the fits often ceasing when it died. Schaller, on the other hand, seemed to have little belief in any active influence of the fetus, denying that its kidneys ever acted before parturition. In Drs. Griffith's and Eden's case the mother had nephritis; the fetus showed diseased tissues, so it was not certain wher ? the origin of the eclampsia lay, though most likely it lay in the mother. As for treatment, delivery seemed usually successful. Van Rootijen and Lambinon, of Liége, bleed in bad cases; but the great success of subcutaneous saline infusions in puerperal septicemia and in sepsis after abdominal sections (Howard Kelly) seemed to indicate the correct treatment for eclampsia unrelieved after expulsion of the fetus. Poncet and Vinay treated successfully a severe case of eclampsia by this method.

Dr. Stabb asked Dr. Griffith whether the percentage and daily amount of urea had been estimated, this being, in his opinion, much more important than the amount of albumin and subcutaneous edema.

Dr. Amand Routh asked why Dr. Griffith had adopted the slow method of inducing premature labor by inserting a bougie instead of the more rapid and certain one of rupturing the membranes. He thought the evidence that puerperal eclampsia was due to a toxemia was clear and that the origin of the toxin was some biochemical change in either the placenta or the fetus.

Dr. Lea asked what were the severe symptoms rendering artificial abortion necessary at the fifth week of gestation. He thought a toxemia was perhaps the cause of the nephritis becoming so much aggravated.

Dr. R. G. McKerron read a communication on

ANTERO-POSTERIOR POSITIONS OF THE HEAD AS A CAUSE OF
DIFFICULT LABOR,

with notes of two cases.

CASE I.—Mrs. B., æt. 41, had had ten full-term children; labors difficult with the use of forceps. She had, when seen by the author, been attended by a midwife for over nine hours; the os had a diameter of rather more than $2\frac{1}{2}$ inches, the head was above the brim, the occiput anterior, the posterior fontanelle $1\frac{1}{4}$ inches from the symphysis, the sagittal suture running almost directly backward. Traction with Simpson's forceps failed to produce any advance. The occiput was rotated with the forceps so as to bring the long diameter of the head into the oblique diameter of the pelvis; the head then passed the brim with moderate traction and the labor was concluded with ease. The child died three days later; the mother recovered well. The measurements of the pelvis were: interspinous, 8.75 inches; intercristal, 10.25 inches; external conjugate, 7.1 inches.

CASE II. was that of a woman, age 38, the mother of one child delivered after a protracted labor by forceps. The child presented and was delivered in the same way as in Case 1. It died on the third day. The subdural space was found distended with blood. The mother recovered well. The pelvic measurements were: interspinous, 9 inches; intercristal, 10.6 inches; external conjugate, 7.5 inches. The author remarked upon the rarity of this presentation.

DR. AMAND ROUTH showed a specimen of myxosarcoma of the uterus removed by hysterectomy. DR. LEA showed a specimen of hematosalpinx occurring in chronic salpingitis.

Meeting of May 3, 1899.

The President, MR. ALBAN DORAN, *in the Chair.*

THE PRESIDENT read a paper on

FIBROID OF THE BROAD LIGAMENT WEIGHING FORTY-FOUR
AND A HALF POUNDS (TWENTY KILOGRAMMES) REMOVED
BY ENUCLEATION; RECOVERY; WITH TABLE AND
ANALYSIS OF THIRTY-NINE CASES.

In this case, where the tumor seems to be the heaviest of its kind on record, the patient was 28, and her last confinement was six years before operation. Shortly afterward a tumor developed in the left iliac fossa; three years later it became impacted in the pelvis. Dr. Ward Cousins succeeded in pushing it into the abdominal cavity; this gave great relief, but the tumor grew rapidly and albuminuria and anasarca set in. The catamenia remained normal throughout. The tumor grew in such a manner that the lower ribs were not stretched out, but

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pushed back behind it. In order to spare as much blood as possible, the ovarian and round-ligament vessels were ligatured proximally and distally, the capsule divided between the liga- tures, which were then tightened, and lastly the incisions in the capsule united, so that after its complete division horizon- tally, and the securing of the cervix uteri, the tumor was enucleated without loss of blood. The cut edge of the capsule was drawn together with a purse-string suture, its cavity being packed with iodoform gauze. The serre-neud was left on the cervix, as it answered well its purpose, and lay sepa- rated by the capsule and its packing from the peritoneal cavity. Though very weak for a few days, the patient did well. The packing was removed in forty-eight hours; the deep cavity soon shrunk up.

The author, after reviewing earlier tables prepared by Sänger, Bayard Holmes, and Lang, brings forward a table of 39 cases of "fibroid" (fibroma and myoma) of the broad liga- ment, with an analysis. In no less than 6 the patient was under 30 years of age, and in just as many over 50. Menstru- ation seems unaffected, nor was flooding ever noted. In 2 cases, including the author's, there were renal symptoms from pressure on one ureter. The growth is often rapid, but in Binaud's case, closely watched for two years, the tumor only attained the weight of 9 ounces. The large tumors cause pain and discomfort, interfere with nutrition, but rarely prove painful. In 27 cases, including all under 20 pounds in weight, the tumor was sessile, embedded in the folds of the broad liga- ment. In 11, possibly 12, the tumor was pedunculated; in 1 the pedicle was twisted. In 25 cases the weight was given. The tumor weighed over 40 pounds in 1, the case here related; between 30 and 40 pounds in 2; between 20 and 30 pounds in 2; between 10 and 20 pounds in 10; between 1 pound and 10 pounds in 8, and under 1 pound in 2. Of the 8 pedun- culated cases, 6 or possibly 7 recovered from an operation re- sembling ovariotomy. Six out of 12 simple "enucleations" of sessile tumors died, but all 6 date from before 1890. Vau- trin, of Nancy, twice did panhysterectomy after enuclea- tion, saving both patients. Pollosson, of Lyons, successfully enucleated the tumor, deep in the pelvis, from under the peri- toneum ("paraperitoneal" method). In 3 severe cases the serre-neud or elastic ligature was applied to the cervix. All recovered. When the tumor is small and limited to the side from which it originated, it may sometimes be safely removed with its ovary and tube, the hypertrophied connective tissue uniting it to the uterus serving as a pedicle. When the tumor is large the removal of both appendages and amputation of the uterus is usually unavoidable. Retroperitoneal hysterectomy is probably the best procedure, if practicable. The chief duty of the surgeon in enucleation of broad-ligament tumors is to avoid loss of blood. The patients are nearly always sickly and anemic, although flooding does not occur in this class of tumor, and they bear hemorrhage badly. The author urges the

method which he adopted as the best way of avoiding loss of blood. Pressure forceps on the distal side are untrustworthy.

Dr. Hubert Roberts read notes of a

CASE OF A LARGE RETROPERITONEAL FIBROID UNDERGOING SUPPURATION.

The patient was a married multipara, age 50. There was a history of an abdominal tumor for over thirteen years. Menstruation ceased eight months ago, since which date the patient had lost flesh and the tumor had increased in size. A large tumor (which, including the pus, weighed 38 pounds) reached up to the ensiform cartilage. The fundus uteri could be felt just above the symphysis. The cervix could not be reached per vaginam. At the operation (performed by Mr. Meredith) adhesions were found between the tumor and the parietes and omentum. The tumor contained thirteen pints of odorless pus; it was removed by enucleation, together with the body of the uterus, and the pedicle treated extraperitoneally. The patient (nineteen days later) was making an excellent recovery. The tumor grew entirely in the broad ligament and had only slight adhesion to the uterus.

Dr. Peter Horrocks asked what were the microscopical differences between a fibroma and a sarcoma. Certainly the rapid growth was very unlike that of a simple fibroma and suggested, clinically at least, some malignancy.

Dr. Ewen Maclean referred to a specimen of broad-ligament myoma which he had removed and exhibited to the Society. The patient was 45 years of age, and the menstrual function had been in all respects normal. Since the birth of her only child, some seven years previously, she had been conscious of a pelvic swelling and of "bearing down." During the last two years the tumor had increased much in size. A broad-ligament myoma weighing 14 pounds was enucleated from the left side and its peduncular attachment to the upper part of the left side of the uterus ligatured and divided. Hemorrhage, due to the rapid retraction of the pedicle, necessitated removal of the uterus and its appendages. The patient made a good recovery.

Mr. Butler Smythe asked what was the position of the uterus in the case reported by Dr. Roberts. In all the cases of intraligamentous tumors that had come under his own observation the uterus was pushed or drawn up high in front of the tumor, and in many cases that organ could be felt through the abdominal wall. He thought the intraperitoneal treatment was very suitable for such cases as those reported.

The President, in reply, noted three more cases of fibroid of the broad ligament. One was under Jacobs, of Brussels, and the other two under his own care. The first of his own cases was a fibrocyst, weighing 8 pounds 8 ounces, in a woman aged 40. The cyst had been tapped and drained in a British

colony. He removed the tumor by retroperitoneal hysterec-
tomy, but the patient died in fifty-three hours; the kidneys
were much diseased. The second tumor weighed 9 pounds 13
ounces and occurred in a woman aged 44. He removed it by
the same operation as in the other case, and the patient was
now convalescent. He did not think the forty-four-pound
tumor was clinically or pathologically malignant; Mr. Shat-
tock reported it as fibrous without any plain muscle cells.

Dr. Roberts, in reply, said that in the case reported the
uterus was quite small and displaced forward and upward close
behind the symphysis. He regretted that none of the Fellows
could throw further light on the suppurative processes in
degenerating fibroids.

The following specimens were shown: Dr. Purslow (Bir-
mingham): (1) A fetus enclosed in the amniotic sac only; (2) a
cyst of the broad ligament. Dr. Galabin: Ruptured tubal
pregnancy. Dr. Addinsell: Ruptured tubal pregnancy.
Mr. Targett: Two cases of bilateral tubercular pyosalpinx.

Meeting of June 7, 1899.

The President, Mr. Alban Doran, in the Chair.

Dr. Thomas Wilson read a paper on

HYDRAMNION IN CASES OF UNIOVAL OR HOMOLOGOUS TWINS.

Although twins derived from separate ova are seven times
more common than those derived from a single ovum, hydram-
nion appears to occur nearly as frequently in the latter variety
as in the former. This paper is founded on two cases of unio-
val or homologous twins which occurred in the writer's practice,
and on twenty other cases collected from various sources.

The usual history of a case of this kind is that the patient,
generally a multipara, for the first few months of a pregnancy
goes on normally. Then, usually at the fourth or fifth month
and without any assignable cause, rapid enlargement of the ab-
domen begins acutely, and leads in the course of a few days or
weeks to extreme distress by reason of the severe pressure
symptoms that are set up. The affection ends in nearly every
case in premature delivery before the end of the seventh month;
in the majority of the cases labor comes on spontaneously; in
about twenty per cent it has to be induced. The contents of
the uterus are found to be twin fetuses of the same sex, one of
which is decidedly larger than the other and is enclosed in an
amnion containing an enormous excess of fluid; the smaller
fetus is provided, as a rule, with a normal or deficient quantity
of liquor amnii. There are a single placenta common to the
two fetuses, a single chorion, and two amnia. The heart and
kidneys of the larger fetus are hypertrophied, often enormously.
Neither fetus shows any malformation, and the mother is
healthy.

The cause of the hydramnion is found in the relation of the vessels of the two fetuses to the common placenta. The twin whose vessels run a shorter or more direct course obtains an undue share of blood from the placenta, in which anastomoses take place between the vessels belonging to the two fetuses. In this way one fetus grows faster than the other, and its heart becomes not only absolutely but also relatively larger than that of the other; that is to say, its heart becomes really hypertrophied. This leads in some way to increased uptake of fluid in the placenta and so to increased exudation by this twin. This increased exudation takes the form of excessive secretion, certainly from the kidneys, probably from the skin, and possibly also from the portion of placenta belonging to the affected fetus; and the accumulation of these discharges leads rapidly to enormous hydramnion of the same fetus.

The diagnosis can often be completely made by observing that the signs of a fetus are limited to a small portion of the circumference of a hydramniotic cyst. The appropriate treatment consists in the induction of premature labor by puncture of the membranes.

CASE I.—Seventh pregnancy; symptoms beginning at the fourth month; labor induced by puncture of the membranes at five and a half months. Larger fetus contained in nineteen pints of amniotic fluid, with large heart and kidneys, thick umbilical cord with dilated vessels; smaller twin in separate amnion with normal amount of fluid, umbilical cord long, thin, velamentous; common placenta.

CASE II.—Third pregnancy; symptoms beginning at three and a half months; labor spontaneous at five months; enormous gush of fluid followed by birth of twins contained in their membranes; larger twin hydramniotic; smaller showing marked atrophy of the wall of the left ventricle; common placenta and chorion.

DR. HERBERT SPENCER congratulated the author on the full account that he had given of this interesting condition. With reference to the clinical aspect of the subject, he (Dr. Spencer) had found that ballottement, impossible to obtain in the dorsal position, could readily be got by placing the patient in the knee-elbow position, when the fetus sank to the dependent part of the abdomen and could be readily felt there. Adverting to the differential diagnosis between hydramnion and an ovarian tumor, he suggested in difficult cases the passage of a bougie.

He thought the author took somewhat too limited a view of the causation of the hydramnion in these cases. It was evident that the theory given by the author would not explain cases of hydramnion in cases of single fetus, and according to that theory hydramnion ought to be excessive in cases of acardiac fetus where the circulation of the two fetuses was carried on by the heart of one: this, however, was not the case. He thought it was a difficult thing to diagnose hypertrophy of the heart in premature fetuses, the size of the viscera varying very

much in fetuses of the same size. In one of his own cases of acute hydramnion with homologous twins the fetuses were almost of the same weight (one just over, the other just under, 1 pound 4½ ounces) and the hearts appeared to be normal. In this case the cord of the hydramniotic fetus was much twisted near the fetus and edematous beyond (the placenta and cords weighed 1 pound 7 ounces): the edema thus produced would, he thought, possibly explain the hydramnion in this case; but he did not see how a hypertrophied heart could explain its occurrence. As fluid was found experimentally to exude into the amnion whether injected into the fetal or natural circulation, it was possible that hydramnion might arise from abnormalities in either. He agreed with the author in regarding the urine as one of the sources of the liquor amnii; if the fetus did not pass urine into the amnion, fetal hydronephrosis, of which he had seen several examples, would not occur.

DR. A. ROUTH thought that the question of the etiology of hydramnion would not be established without reference to its occurrence in single ova, and did not think that the author's theory would explain many of such cases. It did not account for hydramnion occurring in the acardiac twin instead of the hypercardiac; nor for the majority of such cases being female and often puny and lacking vitality, where the arterial tension must be below normal; nor for its frequent occurrence in cases of anencephalus, spina bifida, exomphalos, etc. He thought the diagnosis by means of uterine contractions most helpful, and if abdominal ballottement was obtained over all parts of the abdomen, by putting the patient in the knee-chest position on either side, it proved not only hydramnion, but the absence of any complicating ovarian cyst.

DR. GRIFFITH characterized the paper as one of the most valuable contributions to the subject. His own observations had led him to the same conclusions up to a certain point; but he was unable to accept as proved the view that the fetal kidneys were sources of liquor amnii. It had never been demonstrated that it was possible for a fetus to overcome the tension of the liquor amnii and to pass its secretion, if any, into this sac, and there was evidence that it could not do so. The determination of such minute quantities of urea or similar substances was difficult.

DR. WILSON, in reply, emphasized the fact that hydramnion, like dropsy and jaundice, is a symptom which may depend on some one or more of a variety of causes. His contribution was intended to deal with one group only of the cases, and no attempt had been made to discuss the causes of hydramnion in general. The number of facts in favor of the renal origin of at least part of the liquor amnii left little room for doubting the truth of the theory. Intermittent contractions of the uterus were important in diagnosis. Treatment by rupture of the membranes could only be undertaken when urgent symptoms in the mother demanded it.

The following specimens were shown: MR. MALCOLM:

(1) Macerated fetus from extrauterine gestation retained about a year; (2) Macerated fetus from extrauterine gestation retained seven years; (3) Multilocular tumor growing from the front of the bladder containing papilloma and not connected with either ovary. DR. STEVENS: Drawings of vaginitis caused by bacillus coli communis. MR. TARGETT: A Naegele pelvis. DR. GRIFFITH: Two cases of sarcomatous disease of uterus. DR. WILSON: Unioval twins. MR. ADDINSELL: Unusual thickening of the endometrium in a uterus containing fibroids.

Meeting of July 5, 1899.

The President, MR. ALBAN DORAN, *in the Chair.*

THE FETAL PELVIS; PERSISTENT MENTO-POSTERIOR POSITION OF THE FACE; ECLAMPSIA.

PROF. ARTHUR THOMSON (Oxford) gave a demonstration of the sexual differences of the fetal pelvis. By means of a large number of drawings and lantern slides the author supported his opinion that during fetal life the essentially sexual characters are as well defined as they are in adult forms, and that any differences that occur during growth between the adult and fetal forms, due, it may be, to the influence of pressure or muscular traction, affect both sexes alike, and that such influences are in no way accountable for the characteristic features of the pelvis of the female as contrasted with the male.[1]

THE PRESIDENT considered that Prof. Thomson's researches were of the highest value. As sexual differences occurred in the genito-urinary tract long before birth, it was not surprising that corresponding changes in the pelvis were also established during fetal life. According to Bouchacourt and Brindeau the pelvic brim in the new-born infant was almost circular; their method of investigation (by radiography) seemed, however, to involve sources of fallacy.

DR. GALABIN would like to ask Prof. Thomson if he had extended his observations to the infantile and child's pelvis, and what its relation was to the fetal and adult pelvis. Prof. Thomson had shown that the transverse diameter of the sacrum was less in proportion in the adult than in the fetus; but the development of the wings was certainly greater. Did this development occur especially near the time of puberty, as generally supposed, or uniformly throughout growth? Prof. Thomson had referred to Dr. Matthews Duncan's views as erroneous, but had not entered into any detail. He (Dr. Galabin) did not see anything in Prof. Thomson's demonstrations to contradict Matthews Duncan's views as to the mode of action of mechanical forces on the pelvis and the changes they tended to produce from infancy to adult life.

[1] For full account of the author's observations see The Journal of Anatomy and Physiology, vol. xxxiv., p. 359.

Mr. Stanley Boyd said that until recently it was believed that with the establishment of the function of the ovaries the peculiarities of the female pelvis developed, and it was supposed that the pelvic changes resulted in some way from the ovarian changes. Now Prof. Thomson had shown us that we were endeavoring to account for a change which did not occur. Yet the differences between the male and female pelvis, however early they may appear, remain as striking as ever. Was the female type of pelvis secondary to the development of an ovary? Or is the form of the female pelvis a primary peculiarity—like the ovary itself—due to the cause which determines sex? What effect upon the form of the pelvis has non-development of the ovaries, and has early removal of the ovaries any effect upon the pelvic ring?

Dr. Lewers read a paper on a

CASE OF PERSISTENT MENTO-POSTERIOR POSITION OF THE FACE,

in which the child was delivered alive by the axis-traction forceps.

In the case recorded the patient was a primipara and the face presented with the chin directed backward and to the right. The os had been fully dilated and the membranes ruptured for some time, but progress was completely arrested with the face well down in the pelvis. The ordinary forceps was applied, but slipped as soon as traction was made. On traction being made with the axis traction forceps, the head came lower and the chin rotated forward, the chin being delivered in a very few minutes. The perineum was slightly torn and the child suffered for some weeks from facial paralysis, which ultimately disappeared completely.

The author mentioned another case, similar in essential points to the above, published in the *Clinical Journal* for 1892–1893. He alluded to the liability of the ordinary forceps to slip in these cases. With the axis-traction forceps the position of the blades can be maintained by fixing the screw, and the position of the child is then little likely to be affected by the subsequent tractions which, by drawing the head lower, favored rotation forward of the chin.

Surgeon-General Harvey criticised the use of the word " persistent," seeing that in the cases described the chin did actually rotate forward when the axis-traction forceps was applied.

Dr. Herbert Spencer agreed with the last speaker's criticism. He had met with three cases similar to those described by the author of the paper, in which, with the chin posterior and to one side, the os dilated, the chin low in the pelvis, and progress arrested for some hours, he had easily delivered by converting the face into a vertex by means of Luke Robinson's lever, a highly ingenious instrument, which he exhibited to the

Society. It had the advantage of converting a difficult face (mento-posterior) into an easy vertex (occipito-anterior). He did not think the use of axis-traction forceps scientific in these cases; it was a dangerous instrument when rotation occurred, constituting then a sort of jointed lever very apt to injure the mother. The firm grip of the head could equally well be obtained with the ordinary forceps by tying the handles; he thought, however, that for cases which would not be delivered with the lever, long straight forceps applied to the sides of the child's head would be preferable to the other forms.

DR. LEWERS in reply said that by the term " persistent " he meant that the chin had remained so long behind that the question of delivering the patient had become urgent. He thought that Dr. Spencer was discussing cases in an altogether different category. Rotation forward of the chin was not the rule till a later stage of the labor, when the chin was near the floor of the pelvis and the face deeply engaged. To interfere at an earlier stage was in his opinion unnecessary.

DR. SPENCER remarked that Dr. Lewers had misunderstood him if he supposed that he had interfered at an early stage; he had never done so, and strongly deprecated such interference. Out of about 30 cases of face presentation he only met with the three cases mentioned above, and they were, like Dr. Lewers', in an advanced stage of labor, with the os dilated and progress arrested for some hours. It was to be remembered that in these cases, although the face was low, the greater part of the head remained above the brim; by pushing up the face and drawing down the occiput the conversion was easily effected.

DR. HORACE SAVORY (Bedford) read some notes on a

CASE OF PUERPERAL ECLAMPSIA.

The points of interest in his case were that it was a second attack and non-fatal, though severe; that it was accompanied by hemoglobinuria and very obstinate constipation; that loss of consciousness lasted nine days, but was suddenly regained after mechanical means had been adopted to relieve the bowels of a quantity of very dark, evil-smelling fecal matter. Dr. Savory had collected notes of 64 published cases, and quoted some to show that copremia frequently accompanied eclamptic seizures; he also mentioned several recoveries where purgation had been the only form of treatment adopted. Not only were the bowels of his patient loaded, but the liquor amnii was full of meconium and was of the consistence of thick jelly. He suggested that these two conditions might be factors in the production or accumulation of the eclamptic toxin. The hemoglobinuria he thought was comparable to that which sometimes occurs after excessive muscular exertion, and he quoted the case of a lad under his care who passed two pints of hemoglobinic urine after a run of ten miles. He thought that the excessive muscular effort of the uterus might account for the breaking down of corpuscles and the appearance of hemoglobin in

the urine.   His patient had no signs of renal disease or urinary obstruction.

THE PRESIDENT considered that the fecal-accumulation the-ory deserved more clinical investigation; fecal accumulation, however, occurred frequently in cases of abdominal tumor, but never in his experience caused anything like eclampsia.

Specimens.—DR LEWERS: Three cases of abdominal pan-hysterectomy for fibroids.   DR. LEDIARD: Fetal bones passed per rectum in a case of secondary abdominal pregnancy.

REVIEWS.

A TEXT BOOK ON PRACTICAL OBSTETRICS.   By EGBERT H. GRANDIN, M.D., Gynecologist to the Columbus Hospital; Consulting Gynecologist to the French Hospital; late Con-sulting Obstetrician and Obstetric Surgeon of the New York Maternity Hospital; Fellow of the American Gynecological Society, etc.   With the collaboration of GEORGE W. JAR-MAN, M.D., Gynecologist to the Cancer Hospital; Instructor in Gynecology in the Medical Department of the Columbia University; late Obstetric Surgeon of the New York Mater-nity Hospital; Fellow of the American Gynecological So-ciety, etc.   Second edition.   Revised and enlarged.   Illus-trated with sixty-four full-page photographic plates and eighty-six illustrations in the text. $6\frac{1}{2}$x$9\frac{1}{2}$ inches.   Pp. xiv.– 461.   Philadelphia: The F. A. Davis Co., publishers, 1914–16 Cherry street.

When the first edition of this work was published, some five years ago, the illustrating of medical books was in a state of transition.   A tidal wave of amateur photography had spread over the world and numbered among its victims many members of the medical profession.   These men were not long content with aiming their cameras at trees and cows, but soon insisted on turning them upon their patients for the making of books. Among the dermatologists this finally arrived at a point where the professor of that specialty who had not been guilty of an atlas of skin diseases, published in some fifty parts, was indeed unique among his fellows.   In fact in all branches the hope was held out that actual clinical instruction could be presented and perpetuated by means of the sensitive plate.   The prospect was certainly alluring and the result disappointing.   It must be remembered that at that time the limitations of pure pho-tography were not appreciated as they are now.   It was thought that photographs showed the actual occurrence caught by the keen eye of the camera.   It soon became evident that the personal equation of the camera was not that of the human eye.   In a "snap shot" the Empire State Express, making sixty miles an hour, appeared as if standing still, while a skil-

ful artist could sketch the same train and convey a perfect idea of its speed. It became evident that this element of *time* must always detract from the value of simple photographs as illustrating technical procedures. A photograph will show a bow-legged child before and after osteotomy; but it requires the cinematograph or a clever artist to pictorially describe the operation itself. Besides this, as applied to obstetrics, there is a distortion of the technique itself in order to give the camera that unobstructed view which is necessary. Almost any plate in the book will illustrate this point. Take, for example, plate xxxv., "Clamping the cord and cutting between the clamps." From this plate "the practitioner at a distance from the medical centres" will be surprised to learn that in the operation of tying the umbilical cord after delivery the patient should be held in the lithotomy position by four assistants while the accoucheur plies his scissors. So with the other plates—the position of the patient and of the attendants is unnatural, and a trifling procedure is magnified into a capital operation. It may be added that many of the plates are distinctly bad, and many more are so unnecessary as to suggest padding. For example, it will hardly be claimed that plates xvii , xviii., xix., and xx. show as clearly the point of maximum intensity of the fetal heart as would a simple diagram occupying one-sixteenth of the space.

It seems necessary to speak at this length about the plates, for the reason that we have here a book which is to a large extent built up around its illustrations, and which appeals to its public as "teaching graphically, and thus enabling the practitioner at a distance from the medical centres to acquire his knowledge clinically." From what has been said above it will be evident that the writer of this review does not believe that this claim is fulfilled. He does believe, though, that however disappointed the distant practitioner may be as to the hoped-for clinical instruction, his disappointment will vanish when he comes to read the text. He will find a book written in direct, lucid, and forcible style, and dealing with the facts of modern midwifery in the dogmatic way that the practitioner likes to have facts dealt with when he is confronted with a troublesome case. He will find that though the parts of the work on which he had counted most are extremely disappointing, he is still the possessor of a valuable text book, to which he will refer again and again with increasing pleasure and profit.   B.

A REVIEW OF RECENT LEGAL DECISIONS AFFECTING PHYSICIANS, DENTISTS, DRUGGISTS, AND THE PUBLIC HEALTH. By W. A. PURRINGTON. of the New York Bar. Counsel of the Dental Society of the State of New York. and Lecturer on Medical and Dental Jurisprudence in the New York College of Dentistry. New York: E. B. Treat & Co., 1899.
  This little book, which is largely an assembling of papers previously published by the author. gives in condensed and

convenient form much valuable information concerning the legal status of physicians and dentists.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries, and Improvements in the Medical and Surgical Sciences. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia, etc. Vol. II. June, 1899. Surgery of the Abdomen, including Hernia; Gynecology; Diseases of the Blood; Diathetic and Metabolic Disorders; Diseases of the Spleen, Thyroid Gland, and Lymphatic System; Ophthalmology. Pp. 468. Philadelphia and New York: Lea Brothers & Co., 1899.

The second volume of this series of quarterly digests upholds the standard set by its predecessor. The subject of Surgery of the Abdomen, including Hernia, is ably discussed by William B. Coley, of the College of Physicians and Surgeons of New York, and suitably illustrated. Over one hundred pages are devoted to advances in gynecology, by John G. Clark, of the Johns Hopkins Hospital; among the subjects to which most space is given are The Influence of Castration upon Women, Etiology of Dermoid Cysts, Closure of the Abdominal Wound, and Retroflexion of the Uterus. Diseases of the Blood, Diathetic and Metabolic Disorders, Diseases of the Spleen, Thyroid Gland, and Lymphatic System are treated by Alfred Stengel, of the University of Pennsylvania. Few advances are noticed in connection with diseases of the blood. Diabetes and glycosuria receive careful attention. The section upon Ophthalmology is from the pen of Edward Jackson, of the Philadelphia Polyclinic.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Transitory Acetonuria of Labor.—A. Couvelaire[28] has investigated a number of cases during pregnancy and labor. In 8 pregnant women, during periods varying from the sixth to the ninth month, no acetonuria was present. In 6, one during the fifth, the others during the ninth month, acetonuria was observed upon admission, but disappeared rapidly under rest and proper diet. Two albuminuric and 1 syphilitic patient had no acetonuria, but acetone was found in the urine of 1 case each of gonorrheal vaginitis and bartholinitis, emphysema, and albuminuria. Of 4 cases of retention of dead fetus, only 1 showed acetone, and that only on the day of admission. Of 34 observed during and after labor, 4 showed no acetonuria; the others presented what the author terms transitory acetonuria of labor. This disappeared usually in twenty-four to

forty-eight hours after delivery, more rapidly in multiparæ than in primiparæ. From these results the writer concludes that pregnancy does not of itself cause acetonuria, nor does the retention of a dead fetus; but that labor nearly always produces a transitory acetonuria, appearing during delivery and disappearing during the four days after parturition.

Antistreptococcic Serum in Puerperal Infection.—G. Eustache[29] states that, as antistreptococcic serum has proved inefficient in many cases of puerperal infection, no one can be considered culpable who neglects its use entirely or early in the attack. He mentions the serums, which have been prepared from as many as fifteen varieties of streptococci, as being so much the more likely to contain the necessary antidote in any case.

Hysterectomy in Puerperal Infection.—Upon a foundation of one successful and two unsuccessful hysterectomies for acute septic infection of the puerperal uterus, T. Tuffier[25] bases a paper upon the advisability of this procedure. He has collected 35 cases so treated, including his own. Of these, 13 were cured. Although acknowledging that this proportion is probably too large, on account of the general tendency to report only successful cases, he holds that the operation is worthy of consideration as affording even a smaller relative number of recoveries from an apparently fatal condition.

Septicemia.—W. A. Franks and F. Bates[34] report a case of septicemia following abortion. They treated the case by venesection and infusions of normal salt solution. After trying the above treatment twice the temperature fell to normal and the patient made a good recovery. They believe the curative effect of the salt solution was probably due both to the dilution of the poison and its rapid elimination by the excretory organs, brought about by the high artificial vascular tension.

Uncontrollable Vomiting of Pregnancy.—Masset[30] advises treating the cause of such vomiting, if it can be ascertained. If this cannot be discovered he favors the use of somatose and orexine, with induction of premature labor as the final resort.

Hemorrhage from Lower Segment of Uterus after Delivery.—Maygrier[31] describes a case which gave signs of placenta previa, yielding to heat and rest in bed. Delivery of the placenta and membranes was complete, but severe hemorrhage occurred a few minutes later from the lower segment of the uterus, the clots being found only in this portion and the rest of the uterus being contracted. Removal of the clots and hot intrauterine douches arrested the hemorrhage. Such hemorrhage is usually due to placenta previa or lacerations of the uterus. *Bar*[31] gives the etiology as including also total inertia of the uterus.

Hematuria of Pregnancy.—H. Treub[11] reports 2 such cases. The first, 30 years of age had had five pregnancies, the last ending in abortion at the sixth month. No history of urinary affections. Last menstruation five months before.

For one month the urine had been reddish brown; micturition frequent, not painful. The urine was acid and contained red blood cells, epithelium, and casts. After a few days of rest in bed and milk diet the blood diminished and signs of renal disease disappeared. Pregnancy followed a normal course. The second patient was 25 years old. Tubercular family history. Had suffered from nocturnal enuresis when 12 years of age. The drugs employed caused hematuria until they were discontinued. At the seventh month of her first pregnancy she had an attack of hematuria of unknown origin, lasting five days. Pregnancy ended normally. Another attack began in the fifth month of her second pregnancy, and had lasted three months when she was admitted. Very anemic. Urine contained many red cells; no evidence of renal disease. Exploration with the sound caused no hemorrhage from the bladder walls. The red cells were evenly mixed in the urine. Labor was induced by puncturing the membranes on account of the anemia. The amount of blood immediately and continually decreased, disappearing in four days; no albumin. Rapid improvement, with sudden diminution in size of the uterus, which points to simple congestion of the kidney from active hyperemia.

Deformed Pelvis.—Charles[31] concludes a paper upon the operations in cases of deformed pelvis by stating that, if the interest of the child demands it, Cesarean section or symphyseotomy is desirable. The consent of the patient should be obtained, if possible. The choice of operation should be such as to save the health of the mother. Forceps, version, etc., at or before term, sometimes give better results than Cesarean section or symphyseotomy. If necessary for the mother, the fetus, living or dead should be reduced in size. Symphyseotomy has not yet been shown to be superior to Cesarean section.

Cesarean Section.—In an extensive article upon this subject Paul Bar[20] advises performing the operation before the beginning of labor. The chief theoretical objection is hemorrhage from atony of the uterus, and the writer demonstrates the rarity of its occurrence—six per cent. The chief points in technique which he mentions are: A hypodermatic injection of 15 drops of Tanret's solution of ergotinin before the operation. At least half of the abdominal incision should be above the umbilicus. The uterus should not be drawn out before it is incised. The elastic ligature is more harmful than useful. The incision in the uterus should not involve its lower segment, but should be longitudinal and as high as possible. Transverse incision of the fundus is not recommended. The incision should be made rapidly in two steps: puncture of the uterus, section of the wall and placenta upon the finger in the amniotic cavity as a guide. Whether the placenta lies in the line of incision is unimportant. The child should be extracted rapidly by the feet, the placenta removed, the uterus drawn up and emptied of clots and packed with iodoform gauze from

below upward. Hemostasis may be secured by digital compression of the broad ligaments. The uterine sutures, preferably of silk, should be about ten in number and deeply passed. Superficial sutures should be added if necessary, but tier sutures are useless. After the operation the end of the strip of iodoform gauze within the uterus is drawn into the vagina, and on subsequent days is gradually withdrawn. Rapidity, to avoid shock, and a single assistant, to diminish the risk of infection, are advised. Secondary hemorrhage is rare, shock rather frequent, septic complications are frequent. The operation is dangerous on account of the chance of sepsis, so should not be performed on infected cases. One hundred and seventy cases collected by the writer show a maternal mortality of 6.41 per cent: of 161 children whose fate was known, 5.59 per cent. These figures represent the gross mortality with no corrections. The remote dangers of the operation are hernia during subsequent pregnancies, which is rendered less likely by careful asepsis; thinning of the uterine wall, which may necessitate operation before the onset of another labor and incision in another portion; adhesions to the abdominal wall and viscera, which may then necessitate hysterectomy. Asepsis diminishes the probability of such adhesions being formed. In conclusion, Bar advocates the Cesarean section in preference to the Porro operation or complete hysterectomy, unless one of these is especially indicated, as allowing future pregnancies. the risk of which has been shown to be small.

Livoff [17] records two Cesarean sections which resulted favorably for both mothers and children.

V. C. Netchiporenko [18] describes a Cesarean section performed in a dirty cabin where no aseptic precautions could be taken and with but one assistant to administer the anesthetic and aid in the operation. Suppuration occurred only at one end of the abdominal wound, with slight endometritis, and the patient was about within twenty-two days.

Postmortem Cesarean Section.—Colle [8] happened to be present at the time of the death of a woman from pulmonary embolism. Discovering that she was pregnant about nine months, he went in search of instruments and performed Cesarean about eighteen minutes after the death of the mother. The fetus was deeply cyanosed, but was revived. Colle was subsequently accused of having killed the mother. In view of this fact, he urges the performance of manual dilatation of the cervix and forced delivery through the vagina in such cases, rather than Cesarean section, in private practice.

Symphyseotomy.—Paul Bar [27] discusses at length the conduct of labor before symphyseotomy, the technique of the operation, the after-treatment, the results, and dangers attending and following it. Regarding the relative merits of Cesarean section, he holds that if labor has not commenced this is preferable to symphyseotomy if the operation can be performed aseptically and if the patient is not suffering from any infection, such as influenza or vaginitis. If labor has begun and is very

far advanced, or the membranes have long since ruptured, or if the extraction of the fetus does not seem likely to be interfered with by special rigidity of the soft parts or by incomplete dilatation of the cervix, symphyseotomy appears to be indicated. If labor is little advanced or it seems probable that the soft parts will interfere, especially in primiparæ, or a long cervix causes slow progress, Cesarean section is advised. Cesarean section should not, however, be performed in any case in which the slightest danger of infection exists.

Rubinvot,[22] after discussing the difficulties of symphyseotomy, declares that these are numerous, instances of infection frequent, and delayed unfavorable sequelæ not uncommon. The statistics which he has collected show a maternal mortality of 11.03 per cent and an infantile death rate of 13.97 per cent.

Phlegmasia Alba Dolens.—T. M. Burns,[32] as soon as the condition is diagnosed, curettes the infected area of the birth canal. Three times a day or oftener the limb should be bathed with hot water in the following manner: Bring the hips to the edge of the bed, rest the heel on the chair, place a bowl of hot water beneath the leg, and cover the limb with one wrapping of woollen cloth, then dip a woollen rag in water and wring it out over the anterior surface of the leg. This should be kept up for half an hour, increasing the temperature of the water as rapidly as the patient can endure it. After each bathing the limb should be wiped dry, turpentine and lard or camphorated oil gently applied, and then cotton batting covered with a flannel bandage, and the limb allowed to rest on a pillow. The bowels should be moved two or three times a day and tonics and a fluid diet given. When the limb begins to pit on pressure and the tenderness is slight, cold water followed by rubbing should be employed and the flannel bandage applied next to the skin. Burns reports cases of this affection.

Accidental Uterine Hemorrhage.—According to V. M. Reichard,[33] when the placenta is attached to the upper zone of the uterus and from any cause its attachment to the maternal structures becomes loosened, then we have "accidental hemorrhage." He reports two cases of this variety, one occurring at full term, the other during the sixth month. In the case at term he applied forceps and saved both mother and child. In the other case he induced abortion and saved the mother.

Puerperal Eclampsia.—G. W. Penn,[34] after having tried the simultaneous use of normal salt solution and venesection in puerperal eclampsia, thinks that these intravenous injections so employed permit a greater amount of blood to be taken and hence allow great dilution of the toxic elements.

Menstruation and Pregnancy in Nursing Women.—S. M. Brickner,[35] after studying the histories of 3,947 dispensary patients, found that among them were 442 nursing women, or 11.18 per cent. Of these nursing women, 191 menstruated, or 43.3 per cent. The menstruating women had the first appearance of the flow in the following months after delivery:

1	2	3	4	5	6	7	8	9	10	11	12
..	11	17	25	17	18	20	25	23	11	9	15	= 191.

Of those menstruating, 26, or 13 per cent, were found pregnant; of those nursing, 3 per cent. These women conceived in the following months after confinement:

2	4	5	6	7	8	9	10	11
1	2	1	5	3	3	6	3	2	= 26.

So far as menstruation is concerned, if the flow is profuse and the woman is much disturbed by her catamenia, it is likely that the milk will be so altered in quantity as to rob it of its nutritive value temporarily. This change in the milk could be met by exercise and diet at the menstrual period, and does not alone constitute a reason for the withdrawal of the child from the breast. When the woman is pregnant as well as nursing, he gives the following advice: Provided the woman is strong and vigorous, and is capable to all appearances of doing justice to both the child and fetus, nursing may be continued for a few weeks until the child is capable of taking and assimilating other food.

Hydatidiform Mole.—Eustache [18] describes a typical case of this character, in which the degeneration occurred at the second month of pregnancy, the characteristic rapid increase in size of the uterus, its softness, and uterine hemorrhages being present.

Hydatidiform Mole in a Child.—Bock [3] describes a case of hydatidiform mole in a child $12\frac{1}{2}$ years of age. The child's surroundings and morality, the absence of signs of pregnancy, the regularity of menstruation, all seem to exclude pregnancy as an etiological factor. The first menstruation occurred at 12 years and 2 months, and consisted of a moderate bloody discharge followed in three days by small clots, no pain, duration eight days. The second was accompanied by lumbar pain and was scanty. On the second day a membranous cast of the uterine cavity was passed, and the regular bloody discharge then lasted for four days, unaccompanied by pain. The third menstruation was marked by pain, the discharge on three successive days of blood clots which were casts of the uterine cavity, the first covered with uterine mucosa, and a bloody discharge. The fourth menstrual flow was bloody for three days. A typical hydatidiform mole was then expelled. The period terminated by a discharge of small blood clots for three days. For four years since, menstruation has been normal.

Uterine Fibroid and Pregnancy.—Lanelongue and Boucaud [19] describe a case of uterine fibroid complicating a two-months pregnancy. Hysterectomy having been decided upon for the removal of the tumor, the cavity of the uterus was measured. The sound passed without obstruction to the depth of eighteen centimetres, apparently excluding the possibility of pregnancy.

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Delassus [18] describes an abdominal hysterectomy for uterine fibroid in a woman married twelve years and never having given birth to children. A supposed cystic mass, hidden entirely by the fibroid and palpated previously at only one point, was found upon incision to be the pregnant uterus. A fetus of eight and a quarter months was removed and lived. All history of pregnancy had previously been denied.

Obstruction to Labor from Uterine Fibroids.—Two such cases are described by G. Fieux.[23] In one the tumor, which was situated in the posterior part of the supravaginal portion of the cervix, had caused absolute arrest of the fetal head, resulting in the death of the fetus and necessitating basiotripsy. In the other case the fibroid sprang from the supravaginal portion of the cervix and the lower portion of the body of the uterus. Although it was impossible to prevent its descent in front of the fetal head, it subsequently rose from the vagina and permitted the descent of the latter.

Pyelonephritis of Pregnancy.—Ch. Vinay and A. Cade [20] describe a form of pyelonephritis occurring during pregnancy, characterized by its sudden onset with quite severe general symptoms, sharp lumbar pains, and free discharge of pus in the urine. This pyelonephritis is always situated on the right side. It is easily distinguishable from cystitis. It occurs especially from the fifth month of pregnancy on. Two pathogenic factors—compression of the ureter by the gravid uterus, and infection—are its causes. The infection is often of intestinal origin, is descending, and takes place through the blood. The prognosis for the fetus, and especially for the mother, is usually good. Medical treatment is all that is necessary.

Ectopic Gestation.—Audion [21] reports a case of ectopic gestation in which the fetus occupied the interstitial portion of the tube. The woman died, when about three and a half months pregnant, from periuterine hematocele, without operation.

Lefour and Gibert [5] record a successful salpingectomy for ectopic pregnancy.

Spontaneous Inversion of the Uterus.—Queirel [24] reports a case of normal labor in which, the placenta being attached by the membranes, the woman bore down energetically, in spite of orders to the contrary, and produced an inversion of the uterus. No uterine expression or traction upon the cord was employed.

Gangrenous Mastitis.—H. Roger and M. Garnier [26] have observed a case of gangrenous mastitis in a woman suffering from scarlet fever. After recovery from the latter the mastitis subsided slowly under local treatment. These writers do not regard it as a simple complication of scarlet fever, as they have seen no similar cases in many women affected with the latter disease. They believe it to have been due to a specific micrococcus which was present in large numbers, was pathogenic for rabbits and guinea-pigs, and presented certain characteristics in regard to growth on various media. A very few

streptococci were also present, as is usual in complications of scarlet fever.

Pulse as an Indicator of Puerperal Disturbances.—Torggler's[36] investigation substantiates the statement of Leopold that an alteration in the pulse rate is the earliest and most sensitive indication of puerperal disturbances, and equals if not surpasses the temperature curve as a diagnostic and prognostic guide.

The Treatment of Operable Cancer of the Uterus at the End of Pregnancy.—Thorn[37] in discussing this much-debated subject concludes that the life of the fetus, under this condition, equals in value that of the mother, indicating Cesarean section if the extraction per vias naturales is difficult or dangerous. If the child is dead the uterus should be emptied of its contents and extirpated per vaginam. If labor has commenced, dilatation of the cervix may be awaited: but if delayed, delivery must be effected, after which immediate removal of the uterus is advised. Expectant treatment during pregnancy, even for a brief period, is absolutely condemned. In cancer of the portio, both fetus and uterus should be removed per vaginam, if this can be done without difficulty. If splitting of the cervix should be necessary, divide the anterior wall. The uterine arteries must not be ligated before delivery of the child has been accomplished. Obstruction to delivery from cancer of the portio indicates abdominal section and removal of the fetus and uterus through the abdominal incision. The abdominal wound should then be closed and the cervical stump extirpated per vaginam.

Operations upon the Cervix from an Obstetrical Standpoint.—*Pozzi*[36] speaks in favor of operations upon the cervix in cases where they are indicated, and believes that fear of obstetrical complications should not interfere with their performance, but simply demand careful technique, including asepsis of the vagina and accurate apposition of denuded surfaces. He considers Schröder's operation perfect if properly performed, but requiring extraordinary dexterity. For this reason he advises biconical amputation with unequal flaps, of which the internal is the larger. *Doléris* holds that Schröder's is the only operation which satisfactorily exposes and overcomes the lesions of the cervix. *Tarnier* presents a uterus which had been subjected to a Schröder's or Emmet's operation and which was ruptured during a simple version, the rupture starting at the cicatrix.

Uterus Septus.—Wagner[38] reports 3 cases of labor in uterus septus. In 1 case there was a double vaginal septum, which had to be removed before delivery could be accomplished. According to Wagner uterus septus does not interfere with conception, but premature interruption of pregnancy is abnormally frequent. It hardly retards the first and second periods of labor; during the third period atonic hemorrhages are apt to occur. Adherence of the placenta is frequent, which Wagner ascribes to its implantation upon the septum.

Dystocia Caused by Malformation of the Vagina.—
Guillemet[36] describes an abnormality of the vagina connected
with a normal vulva and a uterus which seemed to be partially
divided into an upper and a lower segment. The vagina ter-
minated above in a blind, conical sac, into which no cervix
projected. Its lateral walls were in contact with each other,
instead of the anterior and posterior as is usual. A second
vagina, whose lower end was closed by terminating against
the pubis, lay parallel to the first and to its left side, commu-
nicating with the first by a narrow opening high up, and
receiving the cervix at its upper end. During labor it was
necessary to make a crucial incision in the wall of the first—
and, at that time, only—vagina, in order to allow the passage
of the fetus.

Monstrosity.—Stouffs[39] describes a monster with double
harelip and imperfect development of both upper and lower
extremities. In the upper, the hand, which consists on both
sides of three fingers, is joined to the clavicle and scapula by a
single bone. The long bones of the legs are absent, a single
centre of ossification represents the tarsus, and the feet of both
sides are perfect except for a webbing of the fourth and fifth
toes. The four extremities resemble those of the seal.

**Absence of Upper Extremities and Partial Defects of
Lower Extremities.**—Wallenstein[40] describes an interesting
case of abrachius and phokomelia. The publication is accom-
panied by an excellent shadowgraph showing clearly the
extent of the defects. The fetus was born alive and continued
to live for one week, when it perished from intestinal catarrh.
The family history is negative. Mother had given birth before
to nine children, all healthy and normally developed. Was
not sick during last pregnancy, and also denies using means to
interrupt gestation. The latter sometimes causes deformities.
The head of the fetus is inclined toward the left side. The
ears are comparatively small and in close apposition to the
head. Congenital ptosis of the right upper lid. Nose flat-
tened, showing abrasions of skin on the tip. Both upper and
lower maxillæ strongly developed. Left sterno-cleido-mastoid-
eus shortened and contracted, interfering with both the active
and passive motion of the head. Upper extremities entirely ab-
sent, not even a rudimentary trace as usually observed in these
cases. Tibia and fibula absent in both lower extremities, the
feet articulating directly with the femora. The somatic func-
tions were normal, the child taking the bottle with apparent
relish. On account of the deformities of the jaw the fetus
could not take the breast. It was formerly thought that this
type of deformities were due to abnormalities of the amnion
and lack of space for the fetus. The shadowgraph, however,
proves that this theory is probably untenable, because this
would not explain the even rudimentary absence of the extremi-
ties. Wallenstein is inclined to ascribe the cause for such
deformities to diminished trophic energy.

Urinary Secretion in the Fetus.—Phloridzin administered to

pregnant women causes an excretion of sugar from the kidneys of both mother and child. Schöller[41] has made use of this now well-known fact to prove or disprove that the amniotic fluid contains fetal urine. If the fetus empties its bladder into the amniotic cavity, the latter must contain sugar after the administration of phloridzin to the mother. In 34 experiments the amniotic fluid was free from sugar, with the exception of a few cases in which circulatory disturbances produced fetal asphyxia and premature emission of urine. These experiments prove almost conclusively that under normal conditions the fetus does not urinate ante partum and that the amniotic fluid is largely a maternal product.

Diagnosis of Labor.—In discussing the difficulties in determining the onset of labor, C. Maygrier[14] states that the only absolutely positive diagnostic points are painful uterine contractions and progressive dilatation of the cervix.

Constipation after Delivery.—Oui[18] calls attention to the frequency of constipation during the puerperium, and reports two cases of sudden rise of temperature during this period. In one this was due to constipation, in the other to the administration of jalap. In the latter case the temperature fell before the constipation was relieved.

GYNECOLOGY AND ABDOMINAL SURGERY.

The Treatment of Uterine Fibroids.—*Zweifel*[43] opened the discussion on this subject and stated that all drugs were of temporary benefit in arresting and diminishing the hemorrhage due to the growth of uterine fibroids. He advises in non-operable cases ergotin and stypticin, but does not approve of its administration in the form of subcutaneous injections. Hydrastis canadensis is, according to Zweifel's experience, without value. Intrauterine injections of liquor ferri sesquichloridi, after previous dilatation of the cervix, are beneficial in some cases, but at times these injections cause most alarming symptoms. Chloride of zinc in the form of injections or solid sticks is less dangerous than sesquichloride of iron, but also less efficacious. Zweifel never observed disagreeable symptoms after curettement, but lost one patient in whom after curettement he made an intrauterine injection with liquor ferri. The woman died from acute peritonitis. Electrolysis may temporarily benefit if strong currents are employed. Against pain, especially against menstrual pain, besides narcotics the fluid extract of hydrastis in twenty-five-drop doses four times daily is said to be of considerable value. We possess no drugs which will arrest the growth, and electrolysis is also ineffective. The only certain means to inhibit the growth of uterine fibroids is to extirpate the ovaries. In the operative treatment of these tumors Zweifel favors their vaginal removal, if this can be accomplished without difficulty; otherwise laparatomy is advised. Vaginal hysterectomy, with or without morcellement, is only permissible in exceptional cases. In Zweifel's experience

it is advisable not to remove the entire uterus, and also, if possible, to leave the ovaries intact, because under such conditions menstruation will continue, although to a lesser degree, and the women are spared the disagreeable symptoms accompanying the premature onset of menopause. In recent years Zweifel has restricted the indications for castration and prefers myomectomy. His statistics for myomectomy show a mortality of 1.5 per cent, and in his last 81 cases he operated without a death.

Rosthorn propounds the question, When shall myomata be treated? and answers that a large number, if causing no pain nor deleterious influence upon the organism in general, require no treatment whatsoever. It is possible, however, that a benign tumor may at any time acquire excessive growing proclivity and assume a semi-malignant character. Rosthorn's second question, as to how myomata should be treated, is answered that in the absence of indications for operations symptomatic treatment is advisable. The speaker states that he has tried ergotin, hydrastis, gossypium, stypticin, and hot vaginal douches for the hemorrhage, without success. He recommends aseptic intrauterine tampons, and, if these fail, curettement. Castration is justifiable in anemic individuals with heart and kidney complications. Ligation of the uterine arteries is only of theoretical interest. Against the symptoms of pressure, saline and, to a lesser degree, Moor baths are found of benefit. In the operative treatment favored by Rosthorn, only the new growth is removed, while uterus and ovaries are preserved to the greatest extent. During pregnancy fibroid tumors should not be removed, except in the face of alarming symptoms, although myomectomy during this period is neither difficult nor dangerous. Rosthorn reports 116 vaginal operations for polypi and submucous fibroids, with only 1 death, and 231 operations for interstitial and subserous myomata. Of the latter 122 cases were treated with the stump retroperitoneal (4 deaths) and 56 abdominal hysterectomies with 9 deaths.

Amann, Jr., discusses the operative treatment of myomata and states that the choice is between enucleation, resection, and radical extirpation. Contrary to Hoffmeier, who is largely in favor of supravaginal amputation (4.2 per cent mortality in supravaginal amputation against 9.6 per cent in abdominal hysterectomy), he advises complete extirpation per vaginam. Amann operates after Doyen's method and employs in interstitial tumors vaginal drainage. His statistics are 30 operations with 1 death; during the last six years 59 vaginal extirpations with morcellement without losing one patient. According to Amann, fibroid tumors should be removed if they render the patient's life uncomfortable. Enucleation is only indicated in exceptional cases. *Werth* reports 17 cases of supravaginal amputation with preservation of the ovaries. Of these, 9 patients had no climacteric symptoms, but in 5 considerable circulatory disturbances manifested themselves. During such operation the uterine and ovarian arteries require ligation.

necessarily interfering with the nutrition of the ovaries. For that reason Werth advises that the ovaries should be attached to the peritoneum. *Säxinger's* discussion was principally as to whether castration is of lasting benefit. He reports 51 operations; in 39 he was able to keep the patient under observation. Of these, 36 patients continued well, but in 3 the tumor continued to grow. In spite of these favorable results Säxinger is not an advocate of castration for the cure of fibroid tumors. *Landau* advises vaginal operation with morcellement, an operation less elegant but also less dangerous than laparatomy. Partial preservation of the uterus is desirable, but not always possible. Landau usually operates after Doyen's method. *Martin* states that medicinal and electrolytical treatment is no longer important. Castration is condemned because he thinks it illogical to remove healthy organs in an effort to preserve diseased organs. Only those tumors should be removed which give rise to distressing symptoms. Complete extirpation of both uterus and tumor is the ideal operation, but under certain conditions he favors enucleation of the tumors. He also states that it is difficult to obtain for the ovaries, if left behind, sufficient nutrition; in some of these cases he observed the development of hematomata of the Graafian follicles.

Küstner is in favor of the vaginal operation because it is less dangerous. The dangers of the abdominal operation are shock and infection. The hands of the operator are responsible for infection, and their sterility can be obtained through wearing of rubber gloves next to the skin and over these thin cotton gloves. *Czempin* has obtained good results through stypticin. In 2 cases of curettement the tumors became gangrenous and caused the patients' death. His statistics are 23 abdominal hysterectomies with 1 death from sepsis, 9 cases with intraperitoneal treatment of stump with 4 deaths, and 2 vaginal hysterectomies with 1 death. *Gottschalk* draws attention to the frequency of cardiac degeneration in fibroid tumors. He advocates vaginal ligation of the uterine arteries, which he performed in 16 cases with considerable success; in 7 patients the bleeding ceased entirely. *Fehling* considers intrauterine treatment, both the application of drugs and curettement, dangerous. Subcutaneous injections of ergotin he found efficient to arrest the growth and hemorrhage. The advantage of supravaginal amputation is that it preserves the pelvic flow intact. Castration is restricted to anemic individuals with nephritis or cardiac complications. *Schauta* prefers abdominal hysterectomy to the vaginal operation and records 146 operations with 5 deaths. In his experience nonremoval of the ovaries has no advantage. He also found that their nutrition and functions were impaired. *Chrobak* obtained good results through ergotin treatment and saline baths. In uncontrollable hemorrhages he recommends intrauterine tampons of dry liquor ferri gauze. Still he is opposed to intrauterine treatment and states that in his experience

electrolysis has caused gangrene in 5 cases. Chrobak prefers the vaginal operation if offering no marked obstacles. *Freund* draws attention to the fact that myomata often undergo malignant degeneration. Sarcomatous degeneration he observed four times in 72 cases, and 4 patients who were operated died subsequently from cancer. Constitutional disturbances are also more frequent than is usually supposed, and diseases of the heart, circulation, and kidneys are not rare. Uterine fibroids, therefore, are not as harmless as generally thought. *Dührssen* removes every fibroid, if accidentally encountered during an operation, otherwise only if giving rise to distressing symptoms. He is a pronounced adherent to the vaginal operation.

Wertheim cautions against removal of large tumors through morcellement, especially in anemic individuals, because this operation is necessarily accompanied by considerable loss of blood. Large, fixed, and intraligamentous tumors should be removed through the abdomen. *Hoffmeier* opposes the advice of Zweifel and removes as much of the uterus as possible. The hemorrhage can be controlled through ligation of the uterine arteries. *Veit* prefers vaginal hysterectomy to supra-vaginal amputation. Small tumors causing no symptoms should be let alone. *Fritsch* removes both ovaries and rarely observes distressing symptoms. The latter occur mostly in hysterical individuals. If the ovaries are left behind they are apt to become congested, swollen, and form adhesions. The uterine stump should be as small as possible to avoid recurrence. In anemic individuals the vaginal method is preferable on account of the lessened shock. *Thorn* always removes the ovaries and rarely observes disagreeable symptoms. He also favors the vaginal operation. His statistics are 42 operations, with morcellement in 33 cases, and 2 deaths. *Bumm* agrees with Fritsch and considers that in anemic, exsanguinated individuals the vaginal operation gives the best prognosis. Total hysterectomy is to be preferred to supravaginal amputation. *Bröse* states that since the prognosis of operative treatment has improved he no longer uses electrolysis in the treatment of fibroids. *Mackenrodt* observed 104 cases of fibroid tumors; amongst these cardiac degeneration occurred eight times. He recommends hysterectomy. Angiotripsy he fears on account of the liability of injuring the ureters. *Löhlein* considers aseptic curettement free from danger. He says the vaginal method is a great improvement. *Olshausen* advises not to inform the patient of the fact that her uterus contains fibroids, if the latter give rise to no symptoms. He has observed fatal cases, weeks after laparatomy, in which a postmortem showed a perforating ulcer of the stomach or small intestines. The probable cause of these ulcers was embolism, a result of the operation. Curettage is permissible if the uterine cavity approaches the normal. To avoid climacteric symptoms one ovary should be left behind. Myomectomy is performed if technically indicated. Cancer of the cervix may arise through diminished nutrition of the stump.

Delore[2] reports a successful panhysterectomy for a fibroma of the broad ligament weighing over seventeen and a half pounds in a patient 44 years of age.

L. Longuet[4] favors operating upon all cases of uterine fibroids: large growths, because of necessity; those of medium size, with a view to performing conservative operations if possible; small tumors, for the purpose of forestalling their growth.

Torsion of the Pedicle in Subserous Fibromyomata of the Uterus.—From a long and detailed article by Ersilio Ferroni[15] are reached the following conclusions: 1. Pedunculated fibromata of the uterus, usually considered to be the most benign variety because they are not so apt to cause pain, hemorrhages, and pressure symptoms, may under special conditions more or less acutely take on characteristics of such gravity as to profoundly disturb the organism and urgently call for treatment. 2. Torsion of the pedicle is the chief factor in this rapid change of character of the myoma, which up to this time has frequently never given the slightest sign of its presence. 3. This torsion of the pedicle is not of very frequent occurrence in subserous myomata, and is not to be confounded with the axial torsion of a uterus affected by fibromata, although the symptomatology and the anatomico-pathological conditions of the tumor are the same in both cases. 4. The causes of torsion of pedunculated myomata, some of which reside in the myoma itself (character of the pedicle, its insertion in the uterus and the tumor, etc.), are complex, may escape our notice during the investigation, and are apparently analogous to those of the torsion of other abdominal tumors. 5. Following torsion of the pedicle the myoma undergoes the most varied anatomical changes, from stasis to gangrene, which are dependent upon the circulatory disturbances and the deficient nutrition of its cells, and it exerts new mechanical and irritating stimuli upon adjacent organs, with secondary effects upon the entire organism. 6. Torsion itself may be acute, slow, or gradual, certain definite symptoms corresponding to each variety. 7. These symptoms are common to other kinds of torsion, so that the diagnosis cannot be made with absolute certainty. The physical changes undergone by the tumor also frequently contradict the results of the objective examination. 8. Myomectomy is absolutely necessary, and urgent in cases of acute torsion. 9. The prognosis is more or less favorable according to the promptitude of intervention, the degree of lesions of the tumor itself, and the duration of the torsion.

Torsion of the Uterus.—Micholitsch[9] describes a case of twisting of the uterus occurring in a woman 58 years old, who for years suffered from a subserous fibroid. The woman had an acute attack of abdominal pain followed by collapse. Laparatomy. Upon opening the abdomen it was found that the uterus contained a subserous fibroid the size of a man's head and turned three times around its axis. The round ligaments were stretched and twisted around the cervix, causing strangulation of the tumor, uterus, and adnexa, and severe disturb-

ances of circulation, with symptoms of secondary peritonitis. Both the tumor and uterus were removed and the patient recovered. The case is of especial interest on account of the unusual amount of twisting and the sudden onset of the symptoms.

Operative Treatment of Retrodeviation of the Uterus. —Schulz [44] reports 89 cases of Alexander's operation and its modification after Lang from the Hamburg Hospital, and confirms the excellent results obtainable through this operation. The Germans perform it more extensively since vaginal fixation has proved a failure, and Lang and Kocher have improved its technique, facilitating the finding of the round ligaments. Schulz writes that the uterus is best brought into normal position if traction upon the round ligament is made toward the anterior superior spine.

Giuseppe Roncaglia [12] discusses the question, reports 58 cases, and concludes: 1. That Alexander's operation is easy of execution and not dangerous, as it does not cause death, and no dystocia during subsequent labors have been noticed, and the danger of post-operative hernia is easily avoided. 2. Its results are merely orthopedic, for which reason it gives remote results far superior to those obtained by other operations, especially vagino-fixation. It is superior to the pessary, for it promptly and permanently corrects the displacement, whereas pessaries require many months to produce an effect, and even then the result is uncertain. This consideration is of great value in the treatment of patients of the working classes. 3. It does not cure inflammatory troubles of the endometrium and uterine parenchyma, which must be treated by the usual methods. From this standpoint the correction of displacements by Alexander's operation gives the best results when the uterine lesions are the least severe. When they are marked they should be treated and almost cured before the operation is performed. 4. It is the best complementary operation for cervical, vaginal, and perineal plastic procedures in the cure of vagino-uterine prolapse complicated by retrodeviations in women who are still young.

J. Godard [11] reports three cases of retrodisplacements of the uterus in which immediately successful results followed the operation of suturing the folded round ligaments through an anterior vaginal incision.

Vaginal and Ventro-fixation of the Uterus.—Gustav Klein [45] states that out of 221 cases of retroflexions and retroversions he has performed 16 ventrofixations: for retroflexion 5 times, primary prolapse of the uterus once, and in 10 cases it was necessary to fix the uterus after celiotomies and adnexa operations. The results were: the uterus continued anteflexed in 14 cases; 1 case soon relapsed on account of the development of a myoma in the posterior uterine wall; the remaining case soon returned to its former position. Pregnancy occurred in none of these cases. He believes that birth disturbances rarely occur after ventrofixation when the method

of Olshausen or that of Czerny-Leopold is used. The opera-
tion for ventrofixation should only be performed after the
pessary treatment, under careful observation, has proved
unsuccessful.

Uretero-vaginal Fistulæ.—G. Calderini [15] describes a case
in which transperitoneal engrafting of the ureters in the blad-
der was performed, and gives the following conclusions:
Uretero-vaginal or vulvar fistula is in some rare cases congen-
ital, and may in some cases simulate a cyst which opens inter-
mittently. Uretero vaginal or uterine fistula may occur as a
result of diffuse disease of the ureters, from dystocia following
labor, surgical interventions in gynecology especially, vaginal
hysterectomy, exploratory puncture, the opening of abscesses
through the vagina with scalpel, or traumatism. Ureteral fis-
tulæ from obstetrical causes are usually due to lesions pro-
duced by the forceps, and the uretero-uterine are favored by
abnormal adhesions of the urinary conduit to the uterus, pro-
duced by morbid parauterine processes following difficult labors
or an abnormal puerperium after normal parturition. The di-
agnosis of ureteral fistula is made by the repeated injection of
milk into the bladder, the urine which escapes by the abnormal
passage remaining unaffected in color. When the fistula is
uretero uterine, we can ascertain which is the wounded ureter
by temporarily plugging the aperture with laminaria intro-
duced through the uterine cervix, and noticing on which side
discomfort is caused. The diagnosis might also be made by
having the patient lie for a long time (and for equal lengths of
time) first on one side and then on the other, and observing the
difference in the amount of urine which escapes during each
experiment. Cystoscopy can be practised by any one possess-
ing the necessary apparatus and experience. The best treat-
ment consists in extraperitoneal engrafting in the bladder by
the transperitoneal tract, in Trendelenburg's position. The
operation is facilitated by a transverse incision, but a lateral
incision will suffice if we know the side on which the lesion is
to be found. Oblique engrafting (Witzel) is useful, but the
suture must be so made as to obtain healing by first intention
and avoid a cicatrix. Cystitis is not an absolute contraindica-
tion to the operation. Subperitoneal capillary drainage from
the engrafted point is of value.

Uretero-ureteral Anastomosis for Traumatism.—F. H.
Markoe and F. C. Wood [36] state that, out of over 100 cases of
operative injuries to the ureter recorded in surgical literature,
it has been impossible to find one in the male sex, most of them
occurring in the course of hysterectomies, either abdominal or
vaginal. It is interesting to note that it is possible to ligate
both ureters so completely that no urine is passed and yet have
no violent symptoms, though it is perfectly possible, as shown
in several recent reports, to have violent and nauseating pain
approaching that of renal calculi. The complete recovery of
the kidney function after twenty hours of absolute obstruction
to the urinary discharge, as shown in the case reported by

Markoe, shows that there is time enough to remedy a resection or ligature of a ureter if only we are on the lookout for the condition. No doubt the ureter is ligated far more frequently than is supposed, and yet does not gangrene because of the abundant and peculiar arrangement of its blood supply. No doubt, also, many cases in which the ureter has been ligated give no symptoms, for the reason that the urinary flow is sooner or later re-established by loosening or absorption of the ligature.

In all cases of severed ureters the operation of election seems to be uretero-ureterostomy, if it may be so called, and preferably according to the method devised by Van Hook. In case a loss of several inches has occurred, an end-to-end or oblique suture will be the preferable procedure. Uretero-cystostomy is chiefly applicable to those cases in which the ureter has been severed at a point below the ileo-pectineal line. Van Hook, in his method of lateral implantation, devised with an idea to prevent any narrowing of the lumen of the ureter by contraction of the cicatrix, such as has been observed after intestinal operations. To accomplish this one end of the ureter is inserted into a slit made in the side of the other segment. By this means Van Hook claims that all constriction by contraction of a circular wound is avoided, and his assertion has been borne out by many operations on animals and three on women. Uretero-enterostomy is to be employed only in cases of exstrophy, or where it is necessary to remove the bladder for extensive vesical growths.

Ureteral Calculi.—According to E. S. Bishop[46] calculi tend to lodge in one of three definite positions: first, at the infundibulum; secondly, just about the brim of the pelvis; and thirdly, at the vesical end. The great majority are found at the upper end of the ureter. It should be borne in mind that this condition may be confounded with ovarian disease. The diagnosis rests upon: (*a*) the evidence of the attack before menstruation commenced; (*b*) the behavior of urination during the attacks; (*c*) the microscopical appearance of the urine; and (*d*) the recto-bimanual examination. In the female a stone can be well defined through the vaginal roof. Removal in this direction is preferable, as a larger extent of the ureter is available for division without risk of opening the peritoneal cavity. Moreover, the drainage is better. The mode of entrance of the ureter into the bladder necessitates the presence of a certain thickness of vesical fibres between the vesical and peritoneal cavities, which may safely be divided without risk of opening up the latter; and, inasmuch as the stone is usually retained only by the few last surrounding the extreme orifice, it is not necessary to divide many before the calculus is sufficiently loose for removal. The extent of division necessary may also be much more easily determined upon and more easily executed than when approaching it in any other direction.

Parotid-gland Extract in the Treatment of Ovarian Disease.—E. P. Mallett,[47] in summarizing the cases which he

has treated by this extract, finds that it relieves the pains of dysmenorrhea in all cases; that it relieves those dull pains referred to the back and ovarian regions. Menstruation, when deranged, becomes more regular as to periodicity and less in amount and shorter in duration. Pelvic exudate seems to soften and become absorbed more rapidly under abdomino-pelvic massage during its exhibition. The general health and spirits seem to improve, as do the dull headaches. The only contraindication which he has met with in its use has been in cases of artificial climacteric, in which cases the flashes of heat and cold were distinctly made more frequent and severe.

Tetanus of Uterine Origin.—A. Turenne[1] gives the history of a case of tetanus, the patient dying within forty-eight hours after the onset of trismus. No wound of the skin or mucous membranes could be found, but the woman stated that six days before she had received an intrauterine injection without any aseptic or antiseptic precautions, in an attempt to induce abortion.

Strangulated Hernia containing Fallopian Tube.—Boudin[2] reports such a case in a woman 50 years old whose femoral hernia had been present five years. It became irreducible ten days before operation, but caused only slight local pain with no gastro-intestinal symptoms. The sac was found to contain only the Fallopian tube, which was strangulated at the neck. The ovary was not included in the hernia.

Laparatomies.—C. Jacobs[3] presents an exhaustive article upon 1,996 laparatomies performed by himself, with a mortality of 3.1 per cent. Of these, 1,105 were celiotomies with a mortality of 3 4 per cent; the remainder were colpotomies and gave a mortality of 2.6 per cent. The paper includes a description of the author's technique in the various operations and a discussion of the indications and results of each.

Tubercular Salpingitis and Peritonitis.—A case of tubercular peritonitis was operated upon by Lauwers.[3] Menstruation had always been normal, general health good, no signs of pulmonary tuberculosis. Five years before her abdomen had suddenly enlarged, and aspiration had removed a large amount of clear fluid. About two weeks before the last operation it had again increased rapidly in size. A large tubercular pyosalpinx was removed from each side and the peritoneum dried. The uterus was normal.

Carcinoma of the Cervix.—Chavannez[5] describes an abdominal hysterectomy for carcinoma of the cervix as showing that even this operation is sometimes futile, although undertaken early as in this instance.

Primary Cancer of Fallopian Tube.—L. Danel[6] records a case of this rare pathological condition. Aged 45, married, one child 25 years of age, menstruation regular. For eight months she had suffered from feeling of weight in the lower extremities and general debility. At each menstrual period there was a serous discharge. Vaginal examination showed a fixed mass in Douglas' cul-de-sac and the left fornix. Opera-

tion disclosed a sausage-shaped mass to the left of and behind the uterus, invading the left cornu of the uterus and adherent to adjacent structures. The left tube contained a pint of lemon-colored fluid, and exuberant papillomatous growths sprang from its walls. The right tube was apparently healthy, but death occurred within a few months from involvement of this tube.

Dermoid Cyst of Mesentery.—Marié, Berthier, and Milian[7] report an operation, a case occurring in a woman 56 years of age, who complained only of albuminuria and anasarca. The cyst removed weighed three pounds four ounces.

Ovarian Cyst.—Folet[8] reports the successful removal of an ovarian cyst containing more than forty litres of fluid from a woman 66 years of age.

Ovarian Cyst.—A. Debuchy[9] presents a description of the removal of an ovarian cyst containing about ten litres of yellowish, gelatinous fluid. It had separated entirely from the ovary and was somewhat adherent to the omentum. As no history of torsion of its pedicle could be obtained, its independence is ascribed to mucoid degeneration of that portion of the tumor.

Epithelioma of Urethra.—In a case of this character described by David,[10] the diseased urethra and anterior vaginal wall were dissected up and removed. The remaining posterior fourth of the urethra was sutured to the mucosa of the vestibule after fastening it beneath the pubic arch. The remainder of the vaginal wall was attached just beneath the new urethral opening. The patient can control her urine for four hours.

Parovarian Cyst.—N. Herbaux[10] reports the removal by Duret of a parovarian cyst which contained a viscous, chocolate-colored liquid, whose walls were thick and covered internally with ecchymotic spots, and which presented many adhesions. These abnormal characteristics of such a cyst are accounted for by a torsion of the pedicle which was found to exist.

Retrouterine Hematocele.—Lauwers[8] gives the history of a case upon which he operated for the removal of a large retrouterine hematocele. The formation of the latter he attributes to a tubal abortion, as there were no symptoms of shock or severe sudden internal hemorrhage, and the tumor consisted of clotted blood varying in consistency.

Ovarian Multilocular Cystic Tumor.—De F. Willard and S. M. Wilson[13] report a case of this variety which existed for thirty-five years. The woman died from influenza at the age of 74 years. She was tapped at intervals varying from eight to twenty months. At such tappings fluid to the amount of about two or more bucketfuls would be removed. From five to ten punctures were ordinarily made.

Tuberculosis of the Breast.—H. Gage[14] discusses the case of a woman 43 years old who had primary tuberculosis of the breast with secondary infection of the axillary glands. Sec-

tions of the gland after its removal showed plainly the different stages of tubercular infection. Tubercle bacilli were demonstrated in several different preparations from the gland containing pus. He believes that if tuberculosis is to be surgically treated it should be by radical removal.

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DISEASES OF CHILDREN.

Acetanilid Poisoning.—Thompson S. Westcott [1] reports the case of an infant of 4 months who was suffering from intertrigo, for the relief of which a dusting powder of pure acetanilid had been used once. Three hours later the skin was found to have a grayish pallor and the lips were bluish, though the surface temperature did not seem lower than usual. Two and a half hours later the appearance was still unchanged and the child was in a heavy slumber from which she could not be easily aroused. A few drops of whiskey were given hourly, and recovery ensued. Since the introduction of acetanilid as a dressing for wounds by Harrel in 1893 numerous instances of toxic absorption have been recorded. Newton records the case of a child with extensive burns on face, arm, and leg. Between twenty and forty grains of acetanilid were used on five occasions in nine days. When it was applied on two successive days there followed a condition approaching collapse, marked by extreme cyanosis, weak and rapid pulse, and dilated pupils. Recovery was gradual. Briggs observed mild toxic symptoms after the use of the drug as a dressing for a circumcision wound in an infant a week old. Carmalt produced cyanosis in a girl of 18 years by the use of the powdered drug on a profusely suppurating ulcer. Rook had two serious cases, one an nfant 10 days old on whom acetanilid was used as a dressing for erythema of thighs and nates, but who recovered. The

second was a baby 4 days old with erythematous inflammation of skin, nates, thigh, and groin, for which applications of bismuth and acetanilid were used. Death occurred within eighteen hours after the powder was first applied. Snow has seen severe symptoms resulting from absorption of the drug from the umbilical stump. In the case recorded the actual amount of surface capable of absorbing the drug was small. In both of Rook's cases there was apparently no break in the surface of the skin, but absorption seems to have been almost as rapid as in cases presenting open surfaces. The conclusion drawn is that the use of acetanilid as a desiccant dressing with young children is distinctly dangerous to life.

Anterior Poliomyelitis.—Charles A. Labenberg,[2] writing of infantile paralysis, says that of all ailments there is none in its incipiency so apt to baffle a young physician, presenting, as it does, an array of early symptoms almost identical with those of meningitis, neuritis, and the exanthemata. In the initial stage the patient has fever lasting from one to seven days, vomiting, headaches, pains in the muscles, slight coma, con- vulsions, and other reflex symptoms. The paralytic stage usually follows this very closely, but it is not uncommon to detect a slight paralysis on the first day of the fever. The onset of the disease is always sudden. The paralysis is easily recognized by its flaccidity, coldness, and bluish cast, due to poor circulation. It is usually general, affecting most of the voluntary muscles In a few days there is a spontaneous re- cession, leaving only certain groups affected. The most com- mon form of paralysis is monoplegia of the lower extremity. During the second week atrophy of the paralyzed muscle will be observed, as well as commencing alteration in the electrical response, and the limb will become smaller and changed in its contour. Various deformities may result from the paralysis, such as varus equinus, equino varus, lordosis, etc. Among the various agencies supposed to cause the disease are syphilis, dissipation, age, infection, exposure to cold and dampness, trauma, acute diseases, and sometimes it appears to be idio- pathic.

In *meningitis* we have many more cerebral symptoms, more rigidity of the neck, the headache is more severe, and the coma and convulsions are more lasting than in infantile paral- ysis. There are also more cranial nerve affections.

In *neuritis* the onset is more gradual, the nervous symp- toms are fewer, and there is pain along the paralyzed muscles, which persists for a long time. The prognosis must always be guarded, as a complete cure is out of the question. We can assure the family that death is very rare, and if it does occur it will be in the first four weeks, and the mind always remains clear. As to the resulting deformity, it may be slight, but the greater the involvement of voluntary muscles the graver will be the prognosis. *Treatment* should be divided into two periods. During the first it should be directed to the general condition and the use of such medicines as will reduce the

fever, such as a thorough purge, small doses of the bromides, quinine, ergot, and local irritation over the spine. Iodides are also given to a great extent as soon as the disease is recognized. After the acute stage the paralyzed muscles should receive attention and their tone and function be restored by electricity, massage, and gymnastic movements. Electricity may be used once or twice a day, each sitting being about fifteen minutes in duration. The current should be just sufficient to cause slight contraction. Both the faradic and galvanic currents can be used together or alternately. If after several months' treatment deformities result, orthopedic measures should be resorted to as soon as possible.

Colic.—Philip F. Barbour[3] treats of colic in infancy. It is a paroxysmal pain occurring in the intestines, and may be due to a number of causes, such as appendicitis, intussusception, enterocolitis, or to lead or arsenic poisoning, but the most frequent cause is a disordered digestion arising from improper food or deranged conditions of the alimentary tract. Infants are more liable to have it, from the fact that their food is more difficult of perfect absorption and hence is more liable to undergo fermentation; and the relative weakness of the muscular fibres of the intestine and the abdominal wall prevents the rapid expulsion of the gas, the accumulation of which gives rise to the pain. Colic may, however, occur without flatulence, and can be caused by whatever will produce a sudden spasm of the circular muscular fibres in the intestinal wall. Colic comes on most frequently at night. Its recognition is usually easy, as the loud, sharp cry indicates pain, and as the pain is paroxysmal the cry is not continuous. The baby also draws its cold feet and hands over the abdomen, which is usually distended and tympanitic. It may be difficult at times to distinguish between the cry of hunger and the cry of colicky pain, for these babies will often seize the nipple with avidity, and the warmth of the milk frequently relaxes the spasm for a little while, but with colic the pain soon returns and is probably more severe. The cry of hunger is less loud and is maintained longer, while the head is rolled from side to side, the tongue drawn back and flattened in the mouth, and efforts may be made to suck the hand or thumb or nightgown. The cry of temper often simulates colic, but there is not the abdominal distension nor the cold hands and feet. The possibility of appendicitis, intussusception, volvulus, incarcerated hernia, hepatic and renal colic should always be kept in mind. There is a form of enteralgia due to malaria which is difficult of recognition and could be suspected only when there is a marked periodicity without the tympany and cold extremities of ordinary colic. The fact that colic frequently comes on at the same time every night will make the differential diagnosis more difficult. Children fed on cornbread that is not thoroughly cooked, or fed on indigestible food—as cold lunches with pickles, etc.—often suffer from colicky pains in the hypogastric region. Castor oil, in small doses after meals, gives relief. Spinal

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caries may produce abdominal pain simulating colic, but a careful diagnostician will recognize the condition. In the treatment of colic give warm enemata to remove the gas. It may consist of soapsuds and water, or have a few drops of turpentine or a half-teaspoonful of glycerin. Hot applications should be made to abdomen, and feet and hands be warmed. By the mouth, the author prefers to give small amounts of hot whiskey and water with a drop of essence of peppermint and a little sodium bicarbonate. Some form of cathartic should be administered after relief of the urgent symptoms The aromatic antiseptics diluted by hot water often relieve the paroxysm and prevent the formation of gas. The prevention of colic consists in proper feeding. The most frequent cause is the presence of too much proteid in the milk, as evidenced by the undigested casein in the stools or the cheesy odor of the latter. Breast-fed children often have colic from an increase in the proteid percentage of the mother's milk, due to excitement, anger, menstruation, etc. Excess of sugar undergoing lactic or acetic acid fermentation will frequently cause colicky pain. This rarely occurs in breast-fed children. Milk which has been frozen is especially liable to cause colic By reason of faulty feeding or the drinking of beer, mucus is formed in large quantities and passes into the bowel as a good culture medium for bacteria, which multiply very rapidly and produce fermentation of the milk or food, with increase of gas and colic. In such cases alkalies are useful. Some form of anodyne may be necessary to relieve the pain of the colicky attacks until such changes have been consummated in the milk as will prevent its disagreeing with the child. Of the preparations of opium, codeine is decidedly the best, as it interferes less with normal digestion and peristalsis. It should be used only as a last resource, however.

Congenital Total Absence of Both Arms (Abrachius) and Partial Defect of Both Lower Extremities (Phokomelia of Virchow).—Wallenstein [4] reports the case of a baby which lived eight days and died of tetanus neonatorum. The family history was good and the pregnancy normal. The right side of the face was larger than the left; there was ptosis of the right eyelid; both arms were completely absent, both legs also, the feet articulating with the thighs; the right foot had four toes, the left only three. A Röntgen-ray photograph demonstrated the total absence of the bones of the upper extremity, and rudimentary bones in the feet. The cause of the condition was, in all probability, lack of developing energy in the very young embryo.

Convulsions in Children.—Walter F. Boggers [5] says that while, strictly speaking, a convulsion is only a symptom and not *per se* a well-defined disease, yet as this symptom is the only prominent one in the majority of cases, and the etiology and pathology are so varied and often so obscure, it should and can be treated as a separate disease. Treatment should be addressed first to the paroxysm and then to the systemic condition

of which the paroxysm is a symptom. When called to see an attack of convulsions the practitioner should lose no time in questioning the attendants, but the child should at once be put in a hot bath (90° to 97°) with cold cloths to its head. A strong child may stay in the bath from ten to twenty minutes, a delicate child from two to five. Bowels should be at once unloaded by a large enema. If overloaded stomach is suspected, give vin ipecac, or alum and molasses, etc. The child should now be placed on a bed, and, if convulsions continue, ether or chloroform may be given tentatively to relieve symptoms until other systemic medicines can be employed. The chief of these are bromides and chloral hydrate. If the child can swallow, from two to five grains of bromide of sodium or potassium with from one to two grains of chloral every fifteen to thirty minutes for four to six hours at 1 or 2 years should be given. If the child cannot swallow, double this amount can be given by the rectum. The use of chloral by rectal injection is one of the most efficient means of checking the paroxysm. Opium must be given guardedly. It should not be given in great congestion of the brain or in coma. It is best administered hypodermatically, one-twentieth to one-sixtieth grain doses of morphine. Nitrite of amyl is highly recommended in certain forms of convulsions, given by the mouth in half-drop doses or by inhalation Constitutional treatment should at once be instituted in cases due to systemic conditions, as rachitis In laryngismus stridulus the child, instead of being kept quiet, must be continually moved in position, body kept erect, child slapped and shaken. Ice or ether should be sprayed over the larynx. It has been suggested that ice be introduced into the rectum. Hot water to the throat, tickling fauces, etc., releasing the epiglottis by the finger, apomorphine hypodermatically, nitrite of amyl.

Cretinism.—F. A. Pillsbury [6] says that cretinism is a disorder which has been found to invariably follow the maldevelopment or the total absence of the thyroid gland during intrauterine life; or the arrest of its growth, whether from atrophy of its substance by disease or by fibrous infiltration in extrauterine life; or the total extirpation of the gland itself, which, however, is rarely found as a cause of cretinism in children. Dr. Starr, of New York, defines cretinism as a congenital condition, preferring to call all other conditions cretinoid or myxedematous. Osler limits the term cretinism to those cases which are due to the loss of function of the thyroid gland, whether it be due to congenital changes or progressive atrophy of its tissue. As to the treatment, the system must be supplied with a rational substance of vital importance to the healthy metabolism of the system, and to that end various methods have been employed. Murray divides the treatment into two stages: first, the removal of the myxedematous condition; and, second, the maintenance of the healthy condition. Various preparations of thyroid gland can be obtained. In a case treated by the author the raw thyroid gland of sheep was

used; a quarter of a lobe of a medium-sized gland is equivalent to ten grains of the extract. The glands used have never been more than a few hours old; they are placed in an aseptic glass jar and dissected intact from the trachea; within an hour they have been cut up under antiseptic precautions and placed in sterile glass jars on ice, where in cool weather they could be kept for four or five days in good condition. In warm weather it is necessary to get glands oftener. The author reports the case of a child of 5 years which was the size of a ten-months infant. Lordosis and a large, pendulous abdomen were especially marked, and there was bowing of the tibiæ in the lower third. The swelling of the face, nearly closing the eyes, the marked mental apathy, and the protrusion of the tongue gave the face the appearance of absolute intellectual vacuity. There was anemia, and a temperature which ranged between 97° and 98°. There was some degree of intelligence present, but perception was slow. It required patience to attract her attention and a lighted match moved in front of her eyes did not arouse any interest. Only loud noises would cause any response, and these she seemed unable to locate. There was total inability to maintain equilibrium in any position. After four years' treatment with thyroid gland, interrupted at intervals for one reason or another, there is marked mental and bodily improvement. The edematous swelling has almost wholly disappeared; there is a very evident growth of the skeleton, with marked emaciation in the tissues. The head has assumed a more natural contour, and the skin has almost entirely lost its mottled appearance and is warm; the sweat glands are performing their function naturally. The bowels still remain in a condition of inertia. Iodine, as the syrup of hydriodic acid, has been given since December, and to its use in conjunction with raw thyroid gland the author attributes the remarkable mental and bodily improvement during the last five months. As a result of the increased activity of the system and mind there is a very evident attempt at walking. Objects are grasped between the thumb and finger without hesitation, and a will and temper are being developed. There is also a decided preference for certain persons, objects, and places, expressed in a very evident manner. It is safe to assume that within a short time an attempt will be made at articulation, no effort having been made as yet to teach her to talk. There is almost entire correction of the curvature of the spine; the length of limb has increased and the size of the body diminished, until they are now of almost normal proportions. The tongue is kept within the jaws, and deglutition is performed naturally.

The author concludes that the most obstinate cases of cretinism, extending even over a number of years, seem to be amenable to treatment, if persisted in, with either one form or another of thyroidal medication. What may be done in the future with an iodine combination remains to be seen.

Diphtheritic Infection in the Newly-born.—Lissner[8] saw a case of extensive nasal, pharyngeal, and tonsillar diphtheria

in a baby 19 days old, who had been well during the first eight days of life and had then begun to breathe with difficulty. Bacteriological examination confirmed the diagnosis, and under serum treatment the child recovered. An older child had been ill with diphtheria at the time of the baby's birth. After three weeks an oculomotor paralysis of the left eye developed, but disappeared in two weeks.

Diphtheria is rare in newly-born infants, and the prognosis is usually fatal on account of the slight resistance of the young organism and the difficulty of feeding the children during the attack. The author attributes his good result to the early serum treatment.

Eczema in Infants.—Two editorials [9] are devoted to the subject of eczema and its treatment. The editor says that it is almost the universal belief of pediatric authorities that in infants and young children this affection is largely of intestinal origin. Certainly, diet frequently plays an important part in its causation, not through the action of any special article of food perhaps, but through a faulty nutrition of the tissues, due to dietary errors. In young children delicacy of the skin is unquestionably a factor of importance in the production of eczema. While it is doubtful whether the disease can be called a diathetic one, it is certain that it is more common in the children of rheumatic and gouty parents. Dr. Bulkley classifies the internal causes of eczema as (1) dietetic, (2) assimilative, (3) neurotic, and the external as (1) climatic, (2) hygienic. The parasitic theory is strongly urged by some, but it is not yet proved that micro-organisms are the exciting cause of most cases, though they undoubtedly are such in some instances. Predisposition is of great importance; the skin of some children becomes eczematous upon the slightest irritation or exposure, in other children the disease can hardly be produced. In infants eczema shows but slight tendency to spontaneous cure; it is prone to relapse, and, as a rule, is a prolonged and discouraging disease. When occurring in children suffering from chronic indigestion it is especially rebellious to treatment, and assurances of speedy cure should be made with great caution. As to treatment, three plans have been advocated by recent writers: local alone; constitutional alone; local and constitutional combined. Those who advise local treatment alone are almost exclusively dermatologists. Pediatrists believe that the disease is not simply a local disorder of the skin, but that it requires constitutional treatment, which includes diet, hygiene, and medication. The food and management of the mother or wet nurse should receive close attention. Malt and alcoholic liquors should be prohibited. Constipation in the infant should receive particular attention. Many children begin to improve at once upon reducing the fat in the milk. Some young patients, however, improve upon the administration of cod-liver oil. No routine practice can be successfully adopted in treating eczema, but each case must be studied individually and treated on its merits.

Elephantiasis Congenita Hereditaria.—Tobiesen[10] reports the case of a 2-weeks-old boy baby, born after a normal pregnancy and labor, who had edema of both feet, extending up to the middle of the leg. This persisted as the child developed. At the age of 14 months he could walk well, and at 2 years the edema remained only in the feet, the skin of the legs being very hard and apparently without any subcutaneous fat, a large vein showing along the inner side. The condition was then diagnosed as an elephantiasis, consisting of hyperplasia of the connective tissue of the skin and subcutaneous tissue, with edematous infiltration. A younger boy, born about this time, had exactly the same condition of feet and legs. Both children were healthy in every other respect. Their maternal grandmother and uncle had been affected in the same way and are well at the present time. Another uncle had had varicose veins of both legs ever since the age of 16 years. It is probable that in this family there is a diseased condition of the veins of the lower extremities, predisposing to congenital elephantiasis in some of its members, and to early and marked varicose veins in others.

Empyema of the Thorax in Children.—John Bion Bogart[2*] reports and describes 23 cases which were treated in the Methodist Episcopal Hospital in Brooklyn during ten years. Nearly all were operated upon; 9 were aspirated before operation. Of 8 uncomplicated cases, 2 died, 1 from pneumonia of the opposite lung, developed the day after operation, the second from scarlet fever and diphtheria contracted seven weeks after operation. Of the complicated cases, 1, a puny boy of 4 years suffering from pneumonia and hip-joint disease with abscess, was aspirated, but not operated upon; he developed double otitis media purulenta, and died of exhaustion two months after admission to the hospital. A second case, who had sustained a compound comminuted fracture of the cranial vault thirteen days before admission, and had a scarlatinal eruption two days later, followed by aphasia and complete right-sided hemiplegia, died of septicemia three weeks after admission. The author draws the following conclusions from the history of his cases: 1. Empyema is most often met with in children who are subject to bronchitis. 2. Males are more frequently affected than females, and the left side more commonly than the right. 3. Empyema in children generally follows pneumonia, the interval varying from a few days to a few weeks. 4. In all cases of delayed or interrupted convalescence from pneumonia in children, empyema should be suspected. 5. If not previously relieved by operation, spontaneous evacuation may, in the majority of cases, be anticipated in from two to three months after the onset of pulmonary symptoms. 6. Spontaneous evacuation, whether external or internal (through a bronchus), rarely results in cure of the disease. 7. The usual symptoms of empyema in children are fever, cough, dyspnea, anemia, emaciation, and night sweats; the usual physical signs, diminished expansion, or bulging, or both, of the affected side, displace-

ment of the cardiac impulse, when the empyema is left-sided, and flatness, with absent, distant, diminished, or bronchial voice and respiratory murmur below the level of the fluid. 8. Because of its insidious development, as well as the diversity of the symptoms and physical signs which characterize its occurrence as a complication or sequel of a great variety of other affections, it is not infrequently overlooked or its manifestations misinterpreted, errors which would generally be avoided by the earlier and more frequent use of the aspirating needle for diagnostic purposes. 9. By its earlier recognition and the prompt institution of appropriate surgical treatment, the duration of the disease may be materially curtailed and the death rate considerably lowered. 10. As in abscesses in other portions of the body, incision and drainage, under appropriate antiseptic or aseptic precautions, in the majority of cases yield the most satisfactory results. 11. In ordinary cases resection of a portion of a single rib, preferably the ninth in the posterior axillary line, should precede incision of the pleura. 12. Where the collection of fluid is large, a preliminary aspiration should be done twenty-four or forty eight hours before rib resection. 13. The condition of the patient frequently contraindicates the use of a general anesthetic. 14. The drainage tube should be large and not too long, and should not be removed until the cavity has been obliterated by the expansion of the lung and the discharge has ceased. 15. Primary irrigation, curettage, and multiple rib resection are contraindicated in children, but either or all may contribute to the close or obliteration of a persistent sinus or cavity. 16. Patients should not be considered cured as long as a sinus remains. 17. In uncomplicated cases the greatest danger to be apprehended after operation is the development of pneumonia in the opposite lung. 18. The temperature in uncomplicated cases is not high before operation, and generally falls and remains normal afterward. A rise in temperature after operation usually indicates imperfect drainage or the onset of pneumonia. 19. In average cases the drainage tube may generally be removed in from three to four weeks, and a cure expected in from one to two months. 20. In cases in which appropriate surgical treatment follows prompt recognition of the disease, speedy recovery, without appreciable deformity and with but slight modifications of the physical signs over the affected area, may be confidently anticipated, while neglected cases not only present grave immediate dangers, but frequently result in palpable physical defects.

Hypospadia Perinealis, Cured Case of.—Waitz [13] treated the case two years and effected a complete cure by means of four operations. The boy is now 9 years old. He was always well and of good family history. The urethra opened at the base of the cleft scrotum, and the penis was well developed. The final result of the operations is excellent.

Infantile Atrophy.—Baginsky [14] rigidly excludes cases of acute disease, and includes only those cases in which no apparent cause is present for the progressive loss of weight and

death. Two groups can be made: the first, embracing cases of actual starvation, can scarcely be classified under the head of true marasmus; the second is the chief group, the members of which almost invariably give a history of long-standing dyspepsia, diarrhea, vomiting, and loss of weight. Chemical study of the urine and feces of these children showed that 45 per cent to 57 per cent of nitrogen is eliminated, while normally 96 per cent should be assimilated. Microscopical examination of the intestines demonstrated atrophic lesions of varying degree, and the conclusion seems justifiable that infantile atrophy is the result of atrophic changes in the intestinal canal which disturb the process of assimilation. Bacteria are found in the blood only exceptionally in these cases, and are then due to some secondary condition, but cannot be regarded as causing the marasmus.

Gastro-enteric Disease in Infants.—John Zahorsky,[21] writing of the pathogenesis of these diseases, says that the macroscopic lesions are inconstant and altogether unsatisfactory. The consideration of the morbid histology, however, gives a far more satisfactory and comprehensive view. The essential lesion in the milder cases is a hyperemia and cellular infiltration of the gastro-enteric mucous membrane, while in the severer forms of the disease there are in addition necrobiotic changes in the cell substance. The columnar epithelial cells may be shrunken, empty, partially or entirely disintegrated. With the proper stains degeneration is easily made out. In cholera infantum an exfoliation of the epithelial lining is a prominent characteristic, but in all forms there is a denuding of the capillary and neural plexus to a greater or less extent. Degeneration of the secretory glands of the stomach and intestines is a concomitant lesion. The submucous layer and intercellular spaces are infiltrated with leucocytes and connective-tissue cells. The liver frequently shows marked fatty degeneration, or cloudy swelling of the hepatic cells, occasionally hemorrhages and necrotic foci. The kidneys may show evidence of a toxic nephritis. Recently extensive changes in the cells of brain and spinal cord have been reported. All the pathologic findings can, without exception, be placed among the morbid entities induced by an intoxication. Acids have been proved to cause diarrheas; in the list are fatty acids, lactic, acetic, and butyric, and even picric. They are almost invariably found in the ileum or colon, since any excess of acidity arising in stomach or duodenum is promptly neutralized by the pancreatic juice. The poisonous animal alkaloids probably play an important rôle in the pathogenesis of gastroenteric disease. Several poisonous ptomaines have been isolated from foods—e.g., myelotoxin from poisonous mussels, tyrotoxicon from poisonous cheese, and a ptomaine produced by the bacillus botulinus. Tyrotoxicon has been found in milk and ice cream. Neurin may occasionally reach the intestinal canal. Many other toxic bases from decomposing proteids may be ingested and produce toxemia. Toxic proteids are of

great importance, especially the albumoses and peptones. These, however, when introduced into a *healthy* alimentary canal, give rise to no symptoms. This is undoubtedly due to some antitoxic agency. Nencki and others have shown that the pancreatic juice destroys the toxins. The bile also possesses marked antitoxic properties against certain poisons. Much less powerful is the gastric juice.

As to the physiological activity of the toxins, the action of the ordinary acids is that of an intense irritant to the colon and ileum. Peristalsis is increased and may cause great colic. Tenesmus is a symptom. We know of no toxic gases which are formed in the intestinal canal, but by distension they so stimulate peristalsis as to cause pain. The action of the ptomaines varies according to their composition. Vomiting and purging are the result of a few, but another, larger list do not show this symptom. There is great prostration. Pains in the head, cramps in the limbs, a sense of oppression of the chest, dryness of the mouth, constriction of the fauces, and paralysis of the secretory glands are the most common symptoms. The temperature is depressed. Convulsions, stupor, and coma are the final symptoms. The predominant action of the toxalbumins is the causation of an infectious fever. Some cause degeneration of the neuron, subsequently resulting in marasmus.

In regard to the origin of the toxins, their production is found in the chemism of cellular activity. In these days of intense nervous activity the human organism frequently generates at some portions substances which are toxic to other portions. Poisons are frequently secreted in breast milk; intestinal irritants are common, exciting excessive peristalsis, with resulting pain and indigestion. Another source of poisons is found in functional derangement of the alimentary glands and absorptive cells. One can readily understand how a pancreatic juice with an active, fat-splitting enzyme may decompose more fat than can be readily transformed by the epithelial cells, and as a result an over-accumulation of fatty acids, which irritate the mucous membrane. The formation of toxic substances in the infantile organism and the excretion in the gastro-intestinal tract is another cause of enteric disease. The greatest source of toxins, however, is found in bacterial activity. These may be generated in the milk inside or outside of the body. The majority of the severer forms of enteric disease arise from endogenic infection. The putrefaction of intestinal contents is caused by the ordinary flora of the intestinal canal, the bacterium coli, bacillus butyricus, proteus vulgaris, bacillus fluorescens, etc. Why these saprophytes assume a virulence is as yet difficult to say. The safety of milk lies in its rapid digestion and absorption; anything that hinders this endangers the organism. When putrefaction has taken place the irritating material is expelled before serious consequences result, but degeneration of the columnar cells is apt to follow, and, until sufficient time has elapsed for them to

be again active, there is a tendency to accumulation of food
and disposition to more putrefaction. Another danger of epi-
thelial degeneration lies in the fact that pathogenic bacteria
are permitted entrance to the lymphatic spaces in the sub-
mucous layer, and by proliferation cause a true infectious dis-
ease. The poison is then found within the tissues, and intes-
tinal juices cannot reach them.

At present greater stress must be laid on infection by other
means than milk. Uncleanliness of the baby's mouth, hands
of the nurse, dirty hands of the infant, playthings, clothes,
seem to be the most frequent method of conveying the poison.
The colon bacillus is the cause of many epidemics of gastro-
colitis. Some lay great weight on the virulence of the strepto-
coccus enteritidis. The bacillus typhosus of Eberth also causes
enteric disease in infants, as do the staphylococcus pyogenes
and the bacillus pyocyanus.

The pathology is not complete without a study of the suscep-
tibility of the infant. Artificial foods confer little immuniz-
ing power, while breast-fed infants show marked resistance.
Foul and overheated air may cause intoxication, indigestion,
infection of intestinal walls, with fatal results. The practical
points of this article are: 1. Putrefaction of intestinal contents
may be controlled by dieting; the prognosis depends on the
destruction of intestinal cells. 2. A true infection of the intes-
tinal wall cannot be cured by a particular diet or antiseptic,
but must run a more or less definite course, when the tendency
to recover spontaneously is present.

**Intubation, its Application to Children's Diseases other
than Diphtheria.**—Johann v. Bokay [22] (whose article is trans-
lated with the special sanction of the author by Edward M.
Plummer) considers that O'Dwyer's procedure, which, at the
end of twelve years, has become a method almost universally
employed in diphtheria of the larynx, daily assumes more and
more importance in the treatment of other stenotic affections.
He has himself applied it to: A. Cases of syphilitic stenosis,
non-syphilitic cicatricial strictures, and hypertrophic subglottic
chronic laryngitis; he reports 5 cases in which other measures
had failed and the children were in great suffering and dan-
ger, and has obtained undeniable and even brilliant success.
B. Cases of difficult decanulation. Of these he had 2 exam-
ples; in one, aided by O'Dwyer's procedure, he was able to per-
manently remove a canula worn six years, in the other to
conquer gradually and with comparative ease the difficulties
of decanulation which were caused by a stenosis due to the
formation of granulation tissue. C. Cases of foreign bodies in
the upper respiratory tract. With the round tubes designed
by O'Dwyer for this purpose the author tried to apply them on
children who had drawn foreign bodies into the upper respira-
tory tract, the foreign bodies being movable; but to his great
regret the result has been only palliative, he not having been
able to remove the body from the respiratory tract without the
aid of consecutive tracheotomy. He attributes his failure to

the circumstance that in each of his observations foreign bodies of such size gained admission (a melon seed, a large bean, an American acacia seed) that their expectoration through the lumen of the tube corresponding to the age of the child was really impossible In spite of these failures he thinks that intubation in every private case of this kind should be attempted, because (a) the possibility of ejecting through the laryngeal tube smaller foreign bodies, as carrot seeds, small buttons, small peas, is extremely probable; (b) when the ejection of the foreign body through the tube has not taken place, but the child has for some hours endured this round tube well, we have at least succeeded in obtaining a relative success by calming the respiration, and we have gained time to make all the preparations for tracheotomy. There must be constant surveillance of the patient in this case, because the foreign body may by chance become involved in the lumen of the tube, immediate extubation becoming urgent. Intubation performed even with O'Dwyer's ordinary tubes may be equally attended with chances of success in cases of the impaction of a foreign body in the air passages. The author cites a case in which a fragment of eggshell was fastened in the glottis. The tube was introduced for the purpose of breaking the shell; the respiration became suddenly free, and fragments of eggshell were coughed up later. D. As an auxiliary procedure facilitating tracheotomy, intubation has been found of great value by the author in about 70 cases in which tracheotomy was indicated for the most diverse causes, as laryngeal perichondritis, ulcerations from decubitus appearing in the larynx as a sequel of intubation, multiple papillomata of the larynx, movable foreign bodies of the respiratory tract. Von Bokay concludes by mentioning that O'Dwyer, for the purpose of practising artificial respiration, has devised a special intubation apparatus which, taken in conjunction with a pair of bellows suitable for application, has already given the best results.

Intussusception.—Charles P. B. Clubbe[23] reports 8 cases of this affection, and says that altogether he has opened the abdomen 27 times for intussusception. Of these 15 recovered and 12 died. The author is decidedly in favor of injections in these cases, because it is certain that in a few the reduction can be accomplished by this simple and safe means. Personally he has been successful in this way with six children. In early cases the intussusception is occasionally completely reduced; in every case, no matter of how long standing, the mass is always reduced to a certain extent, and in the gentlest and best possible manner, and so at the coming operation there is less manipulation of the bowels and therefore less shock. It is common to find an elongated tumor extending, say, from the middle of the transverse colon to the sigmoid flexure. After the injection we probably find the tumor greatly reduced in size and now on the right side, at the first part of the ascending colon. In operating now the abdomen can be opened to the right of the middle line just over the

tumor; this means making a much smaller opening. There is not now any difficulty in reaching the tumor, and there is much less trouble in keeping the intestines from getting outside. Although the injection should be given, valuable time should not be wasted; the injection should be given while the child is under an anesthetic, and before the anesthetic is given the child should be prepared for operation. If, after the injection has been given, the tumor can still be felt, the abdomen should at once be opened. If the tumor should seem to have entirely disappeared, the child may well be put to bed; but it must be carefully watched, and should be examined again by the surgeon in a few hours. If there is any return of the tumor the operation should be performed without further delay. The use of injections has been brought into disrepute by the neglect of these simple precautions.

Henry Howitt states that in the infant we have only the acute forms with which to deal in practice, and possibly only the ileo-colic, which all authorities agree to be the most acute and rapid variety of invagination. It is the ilio-cecal form plus the valve distended and its lumen occluded by the swollen and edematous invaginated portion of ileum, which, owing to the tight constriction at the neck by the valve, in a manner resembles a well-hammered boiler rivet that no evenly distributed pressure from within can force out. The author believes that many instances of the trouble occur in infants, leading invariably to death, without the true nature of the malady being recognized by the attendant, and that when the facts having reference to this variety of intussusception become generally known, fewer deaths will be recorded from certain bowel affections and more lives be saved by surgical measures. He has seen 7 cases, and operated successfully on 4, all of whom were under 6 months of age. Dr. Howitt does not believe in losing time in trying bowel inflation or the injection of fluids. Dr. Howitt operates as follows: '' He maintains the temperature of the child by suitable applications to the extremities and body during operation. Rigid aseptic preparations and precautions should be carried out. A median three-inch incision, avoiding the high-placed bladder, is made; the small intestines are eventrated as rapidly as possible and protected with gauze, which is irrigated with water of suitable temperature. The evisceration allows the obstructed portion of intestine to be brought into view. When, as is generally the case, the invagination has reached the transverse colon, the surgeon cannot bring it out of the wound till the part of the large bowel implicated is disvaginated. This is accomplished by making pressure on the apex of the intussusception, while the intussuscipiens is pulled in the opposite direction. It is done by grasping the colon close to the apex with the hand, and following it up the bowel, step by step, until the colon and cecum are free. The mass is now lifted out of the incision. Then comes the most difficult point, the reduction of the invaginated portion of the ileum. The part is grasped in the hand and firmly pressed

for a few minutes; the pressure is made with the thumb on the apex, while the fingers surround and support the outer orifices of the ileo cecal valve. The method resembles that used in paraphimosis, only the large bowel covers the part from view. Before returning the intestines to the abdominal cavity, the contents which have accumulated in the ileum of above are forced through the affected part into the colon; this proves that the difficulty has been effectually overcome and insures an early movement of the bowel. Drainage is not necessary. The omentum is spread over the intestines to prevent adhesion of the bowel to the line of incision. The dressing is covered with oiled silk, the edges of which are sealed with collodion to prevent urine from reaching the cut. The following table shows the cases of infantile intussusception seen by the author, with particulars:

Initials.	Sex.	Age.	Date of attack.	Treatment.	Attendant or operator.	Date of operation.	Result.	Date of death.	Remarks.
W. C.	M.	2 m. 28 days.	July 2, 1888.	Operation.	Self.	July 4.	R.	......	Left hospital tenth day.
B. W.	M.	5 m. 15 days.	July 17, 1893.	Medicinal.	Dr. W. O. S.	......	D.	......	Post mortem proved diagnosis.
F. L..	M	5 m. 27 days.	April 20, 1894.	Operation.	Self.	April 21.	R.	......	Left hospital tenth day.
— B..	F.	4 mos.	March 31, 1897.	Operation.	Dr. W. F. S.	April 2.	D.	April 2.	Death due to accident during operation.
J McJ.	M.	5 m 20 days.	Sept. 17, 1897	Operation	Self.	Sept. 17.	R.	......	Left hospital tenth day.
J. C...	M.	6 mos.	Nov. 2, 1897.	....	Self.	......	D.	Nov. 2.	Died within 2 hours of onset from convulsion. Tumor present.
C. W.	M.	5 m. 20 days.	April 20, 1898.	Operation.	Self.	April 20.	R.	.....	Left hospital tenth day.

Mastoid Complications of the Exanthemata.—Edward Bradford Dench[15] says that an acute inflammation of the middle ear is one of the most common sequelæ of the exanthemata. When this is not promptly treated mastoid involvement is very apt to follow. Scarlet fever and measles are the two diseases in which aural complications are most frequent. In any eruptive fever, when there is a sudden rise of temperature which cannot be explained by the general condition of the patient. the attending physician should always examine the

ears. If inflammation of the tympanum is present, a free incision should be made in the membrana tympani and should extend from a point just below the tip of the handle of the malleus upward to the tympanic ring. When the temperature is high it is wise to continue this incision for a considerable distance outward upon the superior wall of the canal, dividing the soft parts down to the bone. The object of this incision is not only to evacuate any secretion which may be present, but also to relieve tension and to prevent further extension of the inflammatory process. If the mastoid is tender on pressure, either the Leiter coil or the ice bag should be applied and should be kept on continuously for a period not exceeding forty-eight hours. When mastoid symptoms appear after spontaneous perforation of the drum membrane, it is always wise to attempt to secure free drainage through the meatus by means of the incision just mentioned. Frequent irrigation of the external auditory canal with a lukewarm solution of bichloride of mercury should be employed in all cases where there is a discharge from the tympanum, either as the result of spontaneous rupture of the drum membrane or after surgical interference. In cases seen at a later period, when a fluctuating tumor is behind the ear, operative interference should be at once instituted. Evacuation of the post-auricular abscess by simple incision through the soft parts is not sufficient; even in very young children the mastoid antrum should be entered in every instance. Even should no sinus be found through the mastoid cortex, the bony structure of the mastoid should be entered. Although the cortex may be perfectly normal, we always find in these cases some softened bone, either in the mastoid antrum or in the aditus. Free posterior drainage of the middle ear should always be established to prevent any possible subsequent infection of the intracranial structures.

Measles, a New Sign in.—M. Combe [24] has for two years been conducting researches in regard to the influence of infective diseases upon the composition of the blood. Leaving aside the chemism of the blood, he limited his experiments to a careful and frequent examination of the variations in the hemoglobin, the quantitative and qualitative alterations in the red and especially in the white blood corpuscles, in the infectious diseases of childhood. A recent epidemic of measles has given him enlarged opportunities for the pursuit of these studies. The injurious influence of measles upon the diseases which have preceded or which accompany it have long been known—such as its effect upon grippe, scarlatina, variola, etc. Writers indeed state that measles increases the action of *pre-infections*, even those which were apparently extinguished, such as old foci of tuberculosis, more or less encysted, old and long-forgotten rheumatic spots, etc., and thus favors acute attacks of these troubles. All authorities agree in saying that measles diminishes the resistance of the organism against the ordinary causes of external infections, such as are found in hospitals crowded with broncho-pneumonic patients, or in small, dark,

badly-ventilated rooms filled with people. Measles in these cases increases the virulence of the many germs which reach the mucous membranes; the latter become irritated and inflamed, and the secondary complications are thus initiated. We may therefore conclude that *abnormal or complicated cases of measles* are always due either to internal pre-existent or concomitant infections which become aggravated by a transitory weakening of the system, or to external infections which penetrate through the mucous membranes whose resisting powers have been enfeebled. How does measles produce this lessened resistance ? By depriving the mucous membrane of its protecting epithelium, say some authorities; but other diseases do this without causing the same results. By preparing a favorable culture medium, say others, which is not a very satisfactory explanation. The author has found that during the last two days of the period of invasion, and during the whole of the exanthem, the blood of children suffering from measles shows a marked *hypoleucocytosis.* In all cases the leucocytes diminish at least 50 per cent. A more careful examination shows that it is the polynuclear neutrophile leucocytes which almost entirely disappear. On the second day of the exanthem, for instance, we may find a few transitional leucocytes with irregular nuclei, and a very few polynuclear leucocytes, but nearly all the white corpuscles are lymphocytes, which seem to be increased in number. It is just at this period of the disease that we notice a slight increase in the size of the spleen and in the lymphatic ganglia. Polynuclear leucocytes are the defenders of our organism, the policemen of our blood, and the custom-house examiners of our mucous membranes, to use Dufour's picturesque simile. It matters little whether they act by phagocytosis or by a bactericidal secretion: the important thing to be remembered is that during at least six days the blood of a measles patient is entirely deprived of its means of defence against internal and external microbes. Let there be more or less encysted germs of tuberculosis, foci of amygdalitis or of broncho-pneumonia with streptococci, incompletely cured, these microbes will have a fine chance to develop. The microbes which lodge upon the mucous membranes will also have free play. This hypoleucocytosis is of value in the diagnosis, prognosis, and treatment of measles. The diagnosis of measles is easy, yet it may sometimes be confounded with morbilliform eruptions, rash, etc. Now, morbilliform eruptions do not modify leucocytosis, or else they slightly increase it. Scarlatina is characterized by marked hyperleucocytosis. As to the prognosis, too great or too prolonged hypoleucocytosis is unfavorable. In these cases the diazoic reaction of Ehrlich is also much prolonged. As to treatment, the fact that the measles patient is an organism deprived of its protective agents forces us to employ strict prophylactic measures—to isolate the patient from the first, to avoid a crowded room, admit air and sunshine, to prevent all contact with broncho-pneumonia or other infectious diseases,

and to use strict antisepsis. Washing of the mouth and other mucous surfaces is to be practised when possible.

Tubercle of the Cerebellum.—Wolf[7] reports a case occurring in a girl of 7 who had suffered for three years with severe headaches. Upon recovering from a fainting spell after one of these headaches she had aphasia and weakness of the left leg. During the following year she became progressively worse, with ataxia, headaches, emaciation, increase in the circumference of the head, and repeated general convulsions. She finally died in coma. The autopsy showed the presence of a solitary tubercle as large as a man's fist in the right cerebellar hemisphere, with chronic internal hydrocephalus and acute tuberculous meningitis at the base of the brain. There was also tuberculosis of the right lung and of the bronchial lymph nodes. During life lumbar puncture was done sixteen times, and was always followed by improvement of the child's temper and disappearance of pain and convulsions. The literature has been thoroughly reviewed and twenty-one other cases found.

Vaccinia, Generalized, of the Eruptive Form—D'Espine and Jeandin[8] report the case of a baby girl 11 months old who was vaccinated with lymph which produced a perfectly normal vaccinia in two other children. On the fifth day a pustule appeared on the arm and two or three on the face and abdomen. The eruption spread, involving the entire skin from head to toe, and causing much swelling of the face. There was some fever from the sixth to the twelfth day, but the general condition remained excellent. The arm lesion ran a normal course. A young calf was vaccinated with lymph taken from a pustule on the baby's leg, and a second calf from the first one. Both gave positive results, and upon revaccinating the first animal with vaccine known to be active no lesion developed, the first evidently having proved protective.

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ORIGINAL COMMUNICATIONS.

THE RIGHTS OF THE UNBORN—THE PREVENTION OF CONCEPTION.[1]

BY

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WITH feelings of deep gratitude and just pride I want to thank the Fellows of this Association for the honor of electing me their presiding officer. To hold an office once graced by such as have been honored in the past is a matter of no small moment in one's life and should make one a life-long debtor to the Association.

Among the many shortcomings that Nature was pleased to endow me with was that of oratorical talent. This shortcoming I feel so much the more as my address to you follows

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[1] President's address before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

that brilliant effort of our esteemed and learned President of last year, whose oratory has always excited my wonder and admiration.

In looking about for a subject that might interest you sufficiently, all thoroughly conversant with the thought and knowledge of our beloved art. I have been sadly reminded that every conceivable subject has been thoroughly raked over, and there seemed little left for me to say. Still I hope that our conceitedness will not lead us to believe that we have reached that condition which the great French surgeon of nearly four hundred years ago thought he had arrived at when he said: " Nor has posterity anything left but a certain small hope to add some things."

There are a few things, however, which one might touch upon and which should more frequently and more thoroughly be discussed, if only to condemn the practice from the standpoint of the physician. Such condemnation would have the greater weight, even if it only found the silent acquiescence of such an association as ours. You will pardon me, therefore, for drawing your attention to a matter as to which in your own mind you have long ago come to the same conclusions as myself.

An abuse, fostered by the security that aseptic surgery gives us, has gradually crept into the work of many all over the civilized world. The rights of the unborn are often not respected as they should be and as a strict regard for truth, conscientiousness, and careful professional thought on our part would indicate. The rights of the unborn would be more respected if it could secure for itself competent legal authority to represent it before a court of law. Again and again it has been taught that, " whenever the mother is suffering from such grave disease that her life is in imminent peril and can be saved only by the arrest of gestation, is induced abortion justifiable."

We are also told that the induction of abortion should never be done except with consent of consultant. But this law and custom leaves a wide field for opinion, judgment, and possibly " professional courtesy." Religious doctrines have no weight with me when the destruction of fetal life becomes a necessity to save that of the mother, since both would die if Nature was allowed to continue; but the line must be drawn so close that the mother is actually nearing the grave, and every means known exhausted to remedy the evil, before the decisive step is taken.

Neither can convenience, professional courtesy, actual suffering on the part of the mother, nor social disgrace ever be an indication for what to me would be a most horrible crime—the murder of the defenceless. I have no doubt that what has occurred to me has happened to all of you who are working in this chosen part of the practice of medicine. We are called upon to induce an abortion for hyperemesis long before the mother has reached that stage when her life becomes endangered, simply because the family have forced the attendant to the wall with their sympathetic wails, or because the attendant himself has reached the end of his resources. His patience and his sympathy have run away with his reason, or, if we shall express ourselves less charitably, he has become tired of the case but feels he cannot give it up to another. I can sympathize with him, for I know of no more aggravating condition, where for weeks and months our efforts are little more than comforting; but I cannot consent to be a party in the destruction of the unborn life so long as the mother is not in absolute danger and until I have personally used all resources at my command, which includes treatment away from home and systematic trained nursing. Not that I think my professional friends cannot do equally well, but my conscience must be quieted and I personally must have failed in the endeavor. With a large experience and much patience, I have thus far never been obliged to empty the uterus previous to the viability of the fetus, and I have never seen a mother die. Many cases have given me sleepless nights, as I often felt that the mother was nearing that brink where the uterine contents must be interfered with. I am sure that many more children should be saved. The frequent deaths of the unborn, as caused by the regular profession legitimately, must ever remain a sign of weakness and impotence of an otherwise noble and humane profession.

By artificial or induced abortion we should understand an interruption of gestation before that time when the child is viable—in other words, before the twenty-eighth week. Rare instances have been cited where children have remained alive before that time, but such reports should be received with much reserve.

The indication for such an operation must greatly change with the advances of therapeutics, be they medicinal or surgical. I am sure that before long we shall be told that the life of the fetus must not be taxed less than that of the mother.

When that becomes an axiom our resources will increase to an astonishing extent.

Such changes have been very apparent during the past few years, and, to the honor of a lofty profession let it be said, not to the disadvantage of the fetus and without additional risk to the mother.

During the early professional life of nearly all of us it was deemed wise and just to destroy the fetus when the pelvic conjugate reached below a certain measure. To-day we command that Cesarean section be performed with the greatest likelihood of saving both mother and child, and with much less risk to the mother than was formerly incurred by induced abortion. Even repeated Cesarean section should be performed, and is performed by those of advanced surgical technique and skill.

The same must be said of tumors blocking the pelvic outlet, carcinoma excepted under certain circumstances. In cases of large, rapidly growing myomata and pregnancy, when the suffering of the mother becomes intolerable and her life despaired of, we should first attempt removal of the tumor by myomectomy, and, if that prove impossible, we may then resort to that which becomes inevitable. Thus the reader has been able to shell out a sixteen-pound tumor from a six-months pregnant uterus without interruption of pregnancy.

Not infrequently one will be astonished to see myomata rise above the pelvic inlet in the last weeks of pregnancy, followed by perfectly normal labor.

We may be placed in an embarrassing situation when we consider carcinoma of the cervix. A little reflection, however, must lead us on to the right path. If the disease is discovered early during pregnancy, while a possibility of total extirpation exists, our course is clear. The mother's life should be saved, as the likelihood of a viable child is extremely doubtful.

If pregnancy is well advanced and all chances of radical operation for the mother frustrated and lost, it will be our duty to make an effort to save the child by Cesarean section, with little likelihood of shortening the life of the mother. Here we may feel obliged to wait for the child's viability. The rapidity with which carcinoma spreads after ordinary labor, and the likelihood of septic infection, make the probability of lengthening the life of the mother greater by suprapubic delivery. Statistically we know that out of 603 cases of carcinoma, 43.3 per cent died intra- or post-partum.[1]

[1] Veit: "Handbuch der Gynäkologie."

Arguments in favor of induced abortion not easily refuted are found in the non-replaceable, complete prolapse of the pregnant uterus. In the retroflexed incarcerated uterus, when even a celiotomy will not help us, we have no alternative as yet. Since it has been found that a few cases of artificial fixation have caused insuperable obstacles to normal delivery of the child, this might be cited as a possible indication for the induction of abortion; but Cesarean section is so easy and safe an operation that such an indication must fall at first sight. I am sure we will very rarely be called upon to induce abortion for chronic disease, and especially for nervous disorders. In the former there must be a wide field for careful observation and rational therapeutics as well as good judgment.

When we find ourselves confronted with cases that need artificial termination of a pregnancy, let the indication be drawn so close that the most sensitive conscience will not find fault.

In regard to the mental condition of the laity concerning the induction of abortion, too much surprise cannot be expressed at their ignorance and laxity of conscience.

Persons of good repute, whose standing as good citizens in the community is not questioned, can see no harm, mentally, physically, or morally, in it. It remains for us to teach them that life begins with conception, for it is right here that ignorance of the subject is so stupendously apparent.

In what has just been said you are no doubt aware that the reader has criticised the profession in general for too great laxity in dealing with fetal life, and he hopes he has done so in such terms as will leave no misunderstanding.

There is another question we have to deal with. It is one that is not touched with pleasure, and therefore rarely mentioned as a factor in uterine diseases.

Marriage, as we understand it, is presumed to be the normal institution for the propagation of our species and the care and education of the progeny. If such is the case I am sure we all have often been perplexed by the shameless confession of a handsome and what is apparently a correct young married woman that she prevents conception ; even more, that she entered the marriage bed with the distinct understanding that she desires no offspring, and does so because of the inconvenience it would give her. It has been my sad experience to note this antipathy to be more frequent in the young woman than in the young man. The depth of moral

degeneracy in such cases can only be imagined. I have no patience with these women, and often direct that they may return for my advice and treatment when they have decided to live a natural life and have ceased to be legitimate prostitutes. At times the physician himself advises prevention of conception for the most trivial or imaginary ailment. Social and economic reasons do not concern us in this matter.

When such hideous miscarriages occur in that God-given passion upon which all that is good, true, and noble in our lives depends, there is something radically wrong in the education of the young. It is hard for us to disconnect the moral from the physical well-being. Though we have no right to chastise our patients for their morality, it behooves us to tell them where physical misery depends upon moral decrepitude and to decline our assistance in their illnesses unless proper regard be given to our admonitions. At the same time it seems difficult not to express our disgust for such abnormalities, especially when they have become daily practices. We understand that originally this unnatural and physically harmful procedure originated with those individuals who lay aside all sense of duty and live lives of pure egotism. With them neither church, conscience, nor Nature has any power. They do not understand the sexual instinct in its higher and highest import. Most frequently they are devoid of heart and sympathy. If they could but understand that it is this instinct which causes the blooming of the lily in the valley and the roses by the wayside; that it is this that produces the song of the nightingale and the chirp of the cricket; that it is this that produces all the beautiful colors and forms of nature, and all that is beautiful in the form and intellectual power of mankind. All our poetry and beautiful literature, our social life and culture, art and science, and even our religion, finds its fountain sources and life in it. All progress in the races depends upon this God-given instinct, and certainly without it this life must remain a dreary desert.

You will pardon the digression into which I have been led, for it has not been my aim to speak of the moral condition of these patients, though it is hard to separate it from the physical. I want to draw your attention, however, to the pathological conditions produced by artificial sterility. Looking over my note books, I am reminded that fewer women suffer who already have had several children than those who begin life with this nefarious practice. Without endeavoring to explain

the *rationale* of the pathological condition, we can trace a chain of subjective symptoms to a local condition by combining a number of cases from one's case book. It becomes very apparent that the practice is the cause of the train of symptoms to be enumerated. when we are aware that women living in normal sexual relations. but sterile, do not suffer in such typical manner.

We find ourselves confronted with two sets of symptoms— nervous and local. The latter are those which precede the former. Among the local symptoms we find increased mucous discharges from the genitals, frequent micturition, bearing-down pubic pain, pain in both iliacs and the small of the back. Most commonly this is the order in which the symptoms come on. Now and then the backache will precede or accompany the leucorrheal discharge.

Standing and walking become painful ; thus, owing to lack of exercise, there results a condition of slowness in the action of the bowel, a disturbed digestive and heart action. With failure of the general health the nervous system fails. These patients tell us of several attacks of nervous prostration. A physical exploration shows increased vaginal discharges; the vagina appears red and sensitive, its mucous lining thickened. The cervix and corpus are enlarged. The cervix looks blue, with turgescence of its veins, and an abundant quantity of blood is poured from them as soon as they are punctured. The quantity of glairy mucus which pours from the cervix is greatly increased over normal.

Frequently the uterus is retroflexed, rarely retroverted, and the utero-sacral ligaments so sensitive that they can barely be touched. With these symptoms we nearly always find enlarged, prolapsed, and sensitive ovaries. Among the early symptoms will be an increased menstrual flow, and with it often an easing-up of the congestive symptoms. Later this becomes less than normal and makes the prognosis an exceedingly bad one. One can safely say that when this stage is reached the patient has become an invalid and permanently sterile. In aggravated cases menstrual pain begins several days before the flow and is marked by radiations from the iliac fossæ down the anterior and inner aspect of the thighs. Now we find them complaining of a peculiar pain midway between two periods. In these bad cases intercourse has become painful and often disgusting, so that a certain amount of coldness between the couple has become apparent.

Neugebauer asserted at the International Congress of Medical Sciences, held in Amsterdam in September, 1879, that the origin of cancerous growths can be traced to the practice in question. I have never been able to verify the statement, but one can easily imagine the possibility.

It has been my experience, however, to see a number of cases of myomata in women of 30 years and less who confessed to have followed such practices.

The reader has had a curious experience with some who he thought had reached the sterile period, inasmuch as they became exceedingly desirous of offspring. This being denied them, they became fruitful patients to a succession of gynecologists.

Nervous symptoms manifest themselves variously, from occipital and vertex headaches and minor hysterical manifestations to the graver forms of hysteria and semi-melancholia.

It is true that many continue to live in this fashion with apparently no physical harm. One can commonly notice, however, a dissatisfaction with the world and its manifold interests even in this class. The intimate bond of union between man and wife is missing.

THE PRESENT POSITION OF GALL-STONE SURGERY,
WITH A REPORT OF CASES.[1]

BY

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MY 27 cases of operation for gall stones are extremely small in number when compared with the 468 cases of Kehr, but they have been drawn, with two exceptions, from practice in a city of 70,000 inhabitants and represent but a small part of the cases which I have seen and in which I have advised operation for the relief of gall-stone attacks. As I remarked

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

in a paper before the Association several years ago, we do not know the actual mortality of gall-stone disease, so many dying under other diagnoses and many dying from other conditions not directly associated with gall stones in the minds of the attendants.

This latter possibility I cannot better illustrate than by the history of three cases coming under my observation. Several years ago I was stopped on the street by a professional friend and asked to go to the relief of a case of intestinal obstruction. I immediately procured needed instruments and dressings, and found a patient with a strangulated right femoral hernia, until then unrecognized. Her history was   t   six months before, after a very sudden attack of very severe epigastric pain and vomiting, a lump appeared in the right groin, but went back when the attacks of pain and vomiting ceased, as they did in a few days. Six weeks before my visit the epigastric pain and vomiting had recurred, and the lump had reappeared and had not gone back on the cessation of pain and vomiting a few days later. Three days before my visit the pain and vomiting had again come on and had never ceased, the vomiting being fecal at the time of my visit. The eyes were slightly icteric, but the skin merely muddy; stools had not recently been clay-colored. My diagnosis was strangulated femoral hernia due to the retching attendant upon gall-stone colic. Immediate operation released a knuckle of small intestine, the color of which so improved under hot douching that I believed it to be safe to drop it back into the belly. For thirty-six hours all seemed to go well, when the temperature began to rise, a soft systolic murmur, not formerly heard, was heard at the apex, and delirium set in. There were no symptoms of peritonitis. The murmur increased in audibility, and the patient died the fourth day. My diagnosis before death was septic endocarditis secondary to femoral hernia following gall-stone colic. The autopsy made by my friend Dr. H. C. Cordinier showed no peritonitis, a pin-hole perforation in the eburnated line of the strangulation, belly clean; the endocardium was crimson, and there were shallow ulcerations on mitral valves. In the distended gall bladder was a solitary stone the size of a pigeon's egg.

CASE II.—Man weighing 230 pounds and 54 years of age, of tremendous frame, who had had, under Dr. Donald Buchanan's care, what he had diagnosticated as gall-stone colic lasting several days and accompanied by severe vomiting and retch-

ing. Suddenly a mass appeared in the right groin and scro-
tum. This could not be reduced, and both pain and vomiting
increased; the pain now being in the groin, constipation
absolute. Dr. Buchanan, with my assistance, operated and
relieved a strangulated omental hernia, and in so doing was
obliged to remove a large mass of thrombosed omentum.
Vomiting and pain subsided, and all seemed to be going nicely,
when, about two weeks after the operation, the patient began to
have high fever and pain in the region of gall bladder. Skin
intensely jaundiced, urine porter-colored, and stools clayey.
A dulness could now be traced from two inches to the left of
the median line across to the right a little beyond the right
mammary line, and vertically from the liver border to nearly
the crest of the ilium. Palpation showed exquisite tenderness
and a sense of deep fluctuation. He entered the Samaritan
Hospital, where I opened the mass over its most prominent
part, about two inches to the right of the navel and two and a
half inches above. At least two quarts of pus and blood clot
with necrotic shreds were evacuated. The nature of the mass
I could not determine. It was above the transverse colon and
below the liver border. The erosion of the wounded edges
from the discharge led me to suspect a pancreatic cyst, but this
I could not prove. The patient made a rapid recovery.

CASE III.—German saloon-keeper. Repeated severe attacks
of gall-stone colic of great severity. Complete obstruction of
common duct. Operation advised and declined. Jaundice
and putty-colored stools continued several months, then the
liver began to enlarge until it reached nearly to the anterior
superior spinous process of ilium. This was followed by con-
traction, dropsy of belly and legs. Diagnosis, biliary cirrhosis.
Death. No autopsy could be obtained.

Now, although the second case recovered, it was clearly con-
nected with the original gall-stone attack, and the situation of
the fluid collection makes the connection still more probable,
whether due to a perforation of a gall duct, a gall-bladder
abscess, or a pancreatic hemorrhage or cyst.

In the third case, despite the occupation of the patient, he
was not an alcoholic, and the sequence of complaints was
unbroken from the gall-stone colic until death from cirrhosis
of liver.

I have gone at some length with these cases, because, had
they all died, gall stones would have been as much the primary
cause of death as the last pathological diagnosis.

All but 5 of my 27 cases were in women. Of the women, the youngest was 22 and eldest 69; of the men, the youngest 23 and eldest 59. In 2 women the stones were solitary and in 2 of the men; in women, confined to the gall bladder and by their ball-valve action exciting paroxysms. In 3 women, in addition to the removal of stones in the gall bladder, I crushed stones in the common duct. These all recovered without trouble. In 2 men and 1 woman I opened the common duct and removed stones from the common duct by incision of the duct without suturing the duct, and all recovered. The histories are briefly as follows:

CASE I.—Woman, æt. 59, married, for years had suffered from so-called neuralgia of stomach. At time of operation intensely jaundiced and mere skin and bone. Dense adhesion between transverse colon, liver, and stomach. After separating them no gall bladder could be found, but deep in belly, between liver and transverse colon and above the foramen of Winslow, a mass could be felt which apparently contained stones. This was incised between artery clamps and some one hundred pea-sized stones removed; a finger introduced into the opening passed upward into the hepatic duct and downward toward the duodenum, while to the right was an opening admitting the finger into a gall bladder contracted to the size of a hickory-nut. Drainage tube was passed into hepatic duct and a glass tube threaded over it and safeguarded by tampon of sterilized gauze. Normal recovery. Fistula closed in sixteen weeks.

CASE II.—Machinist, 37 years old. Patient had "belly-ache" frequently for years, attacks lasting one to three hours, occurring at all times. Never jaundiced until present attack, which began two weeks before my visit. Pain occurred daily, and at time of my first visit the patient was decidedly yellow and stools putty-colored. Emaciation and loss of strength, owing to the continued pain and loss of appetite, were so great that the patient assented to operation. After breaking up very firm adhesions between transverse colon and liver border, a semi-fluctuating mass was found in the situation of the common duct. Incision of this gave exit to several ounces of dark-green bile, and the liver, which till then was a *dark olive-green, became reddish.* A single round stone half an inch in diameter was found low down in the common duct. The common and hepatic ducts were dilated to the size of the thumb, and from them the little finger could be passed into a

very much contracted gall bladder. Rubber drainage in hepatic duct, glass drainage over it to the wound in common duct, all safeguarded by aseptic gauze tampon. The rubber drainage was accidentally displaced the second day. The glass drainage was removed the fifth day and the gauze the seventh and eighth days. The entire wound was tightly closed the seventh day. Stools did not become colored until after several days, and it was a fortnight before the jaundice had greatly diminished. Patient has since been in perfect health.

CASE III.—Physician, 59 years old; always in robust health until within eighteen months, when he began to have pain in the stomach which he ascribed to dyspepsia. In June, 1897, he first consulted me, when I diagnosed gall stones and advised operation, but he would none of it; in fact, did not believe it. In December, 1897, he again consulted me. Pain had occurred very frequently of late—sometimes two or three attacks in a day—with marked loss of appetite, intense jaundice, and putty stools. Now the patient believed he had cancer of stomach or liver. My diagnosis was complete obstruction of the common duct by stones. Three days later I operated at the doctor's home in Vermont. Owing to the stoutness of the patient the operation was a very difficult one. Adhesions were numerous but easily separated; the gall bladder contained three ounces of dark bile and tea-ground-like sediment, but no stones. The common duct was found completely jammed with stones. Carefully incising it, ten stones were removed. Duct wound not sutured. Gall bladder stitched to the parietes and drained with rubber tube. Rubber tube in hepatic duct, glass tube over it to common duct. Tampon to safeguard it all. Temperature and pulse in three weeks never above normal. The only trouble was the patient bullying his doctors and nurses for water and morphine until I read the riot act and prohibited morphine, which had been given him. An abscess formed about a broken silver suture. The fistula did not close until the twenty-sixth week, which I ascribed to an overlooked stone subsequently passed. The patient is now free from pain and in perfect health, carrying on a country practice.

My experience has been that in the vast majority of cases simple cholecystotomy with drainage of the gall bladder after the method of Tait is the operation of choice, inasmuch as it removes the stones from the most common situation, the

gall bladder, and by the drainage carries off the infected contents of the bile canals. In the Heidelberg clinic the contents of the gall bladder were shown almost without exception to be teeming with bacteria when first opened, yet after three weeks' drainage every one was sterile. The occasional occurrence of typhoid cholecystitis is another reason for prolonged drainage. This last spring I saw with my friend Dr. H. C. Cordinier a German woman of 50 years of age who had numerous severe attacks of gall-stone colic. After the last attacks, lasting somewhat over two weeks with daily paroxysms, the temperature rose to 104°, and the patient was intensely jaundiced and the enlarged gall bladder exquisitely tender. My opinion was that we either had to do with a suppurating choloangeitis or typhoid infection. Widal's test showed typhoid reaction, and the patient had a regular course of typhoid fever. Operation declined after recovery from typhoid. The general typhoid infection of course contraindicated an operation. But in view of the experience of Maurin, Richardson, and others with cholecystitis, any subsequent operation will demand an efficient drainage of the gall bladder and ducts if one would remove the typhoid germs, which have been found as late as eighteen years after an attack. In view of the success now attending the opening of the common duct, our views regarding excision of the gall bladder must be modified. Formerly most operators believed it to be indicated only in malignant, gangrenous, or ulcerative conditions. But inasmuch as stones are most frequently found in the gall bladder alone, there may be anatomical conditions, such as contracted gall bladders and dangerous traction upon the stomach and duodenum if the gall bladder is sutured to the parietes, which will make the excision an operation of choice over the simple Tait operation. However, before undertaking an excision we must be confident that the common duct is not occluded, or we invite disaster by the operation. If there is any doubt, one would better do a cystotomy and drain with tube and gauze rather than to incur a dangerous degree of traction or to run the risk of leaving occluded bile channels.

Stones in the cystic duct, unless they can be easily pushed back into the gall bladder, are best removed by simple incision of the duct, either with or without its suturing.

The old operations of crushing *in situ* as done by Tait and Kocher, or needling as done by Thornton, no longer deserve acceptation, as they may leave in the ducts débris to become

the nidus of formidable concretions. A clean incision and re-
moval of unbroken stones is vastly the most surgical proced-
ure, now that we can close the opening with suture or safeguard
it by drainage and tampon. In view of the bacteriological
results from the Heidelberg clinic, I, who personally have been
led to draining the common and hepatic ducts instead of sutur-
ing them, am the more confirmed in the propriety of this pro-
cedure, instead of contenting myself with the suture of the
duct after removal of the stones. In none of my cases have
I seen McBurney's operation of opening the common duct
through the duodenum indicated, but that it has a field in the
case of stones near the intestinal opening of the duct is certain.
A post-duodenal or transpancreatic incision is much more
dangerous, the first by reason of the arteries surrounding the
duct, and the second by the added danger of a pancreatic fis-
tula. In the few cases in which I have tried the duodenal in-
cision on the cadaver it did not appear in the medium belly
very difficult. McBurney's cases, and, I believe, Kocher's, have
all recovered. It is from the cases of stones in the common
and hepatic ducts that we are to expect our greatest number of
so-called " recurrences." I say so-called " recurrences," be-
cause I believe that in most instances we have to deal, instead
of a true re-formation of gall stones, with a stone which has
been overlooked, washed down from the hepatic ducts, or of
which the nidus has been a fragment left by crushing a stone
during a previous operation. Of 27 cases I know of but one
in which there was a subsequent attack, and that was in a
case in which, in opening the common duct, I crushed some
of the stones completely plugging it. The fistula was slow
in closing, and I am inclined to think I did not remove all
the fragments. My twenty-sixth case and my second fatal
case was one illustrating a class of cases which one will from
time to time meet in a large series. German woman, 55 years
old, very feeble and frail; gall-stone attacks for many years,
diagnosticated as dyspepsia, neuralgia of the stomach, etc., *id
omne genus*. Came under my observation a fortnight before
operation with paroxysms of great severity occurring two or
three times a day; complete anorexia. Nothing seemed to con-
trol the attacks, and vomiting occurred so often that I counselled
operation as the only hope. The stomach was dilated, but no
mass could be felt. At the operation the omentum and trans-
verse colon were found intimately adherent to the liver, and on
breaking these up the gall bladder was found adherent to the

duodenum and stomach by dense adhesions; these, partly by knife and partly by blunt dissection, I freed, and removed from the gall bladder thirty-seven stones, several the size of almonds of the most irregular, flattened quadrilateral shape. I wished to do a gastro-enterostomy, but the patient's condition demanded a rapid completion of the operation, and I contented myself with attaching the gall bladder to the parietes, with drainage, and closed the wound. Pain there was none to mention; the bowels moved and flatus passed, but the stomach did not take up its work. Food would be retained for twenty-four hours and then vomiting would come on. Without any considerable elevation of temperature, this condition lasted just a fortnight, when the patient died of the results of a dilated stomach. In just such cases as these Kehr has wisely and successfully combined his gall-stone operations with gastro-enterostomy and pyloroplasty. On reading the report of his cases in the *Archiv. für klin. Chirurgie,* I was greatly impressed with the wisdom of this addition to our means of attack upon cases of long duration in which cholecystitis and local peritonitis, by adhesions and bands, had changed the normal physiological relations to one of the hardest problems presented to an operating surgeon. If these cases are to be prevented, early operation is the only way to prevent them; but when they exist the patient must incur the risk of an additional operation. The extent and density of the adhesions in chronic cases is sometimes astounding, and Kehr's combination of gastro-enterostomy and pyloroplasty with the accepted forms of gall-stone operations greatly extends the field and increases the success of operations in cases otherwise hopeless. A permanent fistula means in most cases either improper suturing of the gall bladder to the integument and not to the peritoneum and muscular fascia, or a stone has been overlooked. In the cases in which the permanent fistula seems to be due to an insurmountable obstruction in the common duct, we are warranted in joining the gall bladder to the intestine. But in view of cases of infection of the biliary apparatus in some of these cases in the practice of French surgeons, and our present knowledge of the frequency of intestinal infection through the common duct, I, for one, believe that making a fistula between the gall bladder and intestine will be very rarely indicated and never ought to be done to side-track gall stones in the common duct.

To sum up, we have :

1. In Tait's operation of simple cholecystotomy with drain

age of the gall bladder the really ideal operation for gall stones
in most cases, removing, as it does, the stones, and draining
infected bile canals, and leaving no sutures as a nidus for an-
other crop of stones, as Kehr and Homans have experienced.

2. In incision of the common and cystic ducts is the safest
and most surgical means of removing stones in them.

The question of sutures or drainage of the ducts must be
decided by the future.

3. In view of the splendid results of incision of the ducts
for obstructing stones, excision of the gall bladder may find a
wider field than heretofore.

4. McBurney has shown that incision of the duodenum and
either dilatation or incision of the common duct through this
incision is, in skilled hands, both efficient and safe for the
removal of stones low down in the common duct.

5. In neglected cases with dense and many adhesions and
dilated stomach, an additional gastro-enterostomy or pyloro-
plasty will save cases which would otherwise die.

6. The mortality of the simple cases is practically *nil*.
Even in my 27 cases I have had but two deaths directly con-
nected with the operation. In one the patient, treated for weeks
for cancer of the stomach and intensely jaundiced, died the
fifth day of cholemia; and in the second case the cause of
death was a dilated stomach in which a gastro-enterostomy
would have given a vastly better chance. A third case was
convalescent from the operation when attacked by a fatal attack
of grippe two weeks after operation.

105 THIRD STREET.

ECTOPIC GESTATION: SHALL THE CASE BE OPERATED UPON AT OR NEAR TERM, THE CHILD BEING ALIVE?[1]

BY

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As preliminary to a discussion of this subject I wish to report
the history of a case of ectopic gestation, of eight months' dura-
tion, and operated upon five weeks after the death of the fetus.

[1] Read at the meeting of the American Association of Obstetricians
and Gynecologists, at Indianapolis, September 19–21, 1899.

The patient, Mrs. A., age 34, had been married five years and was a woman of good health until she became pregnant. She menstruated last, April 7, 1898, and signs of pregnancy appeared a little later. In the latter part of June she had uterine hemorrhages and irregular pains, indicating threatened abortion. A few days later she passed membranes and within a few days became quite ill, and her physician thought there were retained membranes and placenta. He dilated the uterus and curetted it, removing some portions of the retained products of gestation, undoubtedly portions of decidua.

The following day the patient became very ill, was prostrated, pale, and had a rapid pulse. Fever followed. Combined examination showed a mass in the pelvis of considerable size. I saw her in consultation with her physician the latter part of June, and again about a week later. I halted in my diagnosis between suppurative disease of the tubes and ovaries and ruptured ectopic gestation. I was about to leave the city on my summer vacation, and asked to be released from the case. Dr. Pfaff was called in consultation the next day after my visit and made a diagnosis of ectopic pregnancy, probably interstitial. I lost sight of the case until November 26, when I was called by Dr. A. L. Wilson to visit the patient in consultation with him. Dr. Wilson had made a diagnosis of ectopic pregnancy with a living child.

I fully concurred in his diagnosis. The abdomen was as large as at eight-months pregnancy, and the outlines of the fetus could be felt and the fetal heart sounds were distinct. On consultation we decided to await the death of the fetus and the cessation of placental circulation.

December 2 the patient had symptoms of labor, and after a few hours had a hard chill, which was followed by fever lasting several days. After the chill the patient felt no more movements of the child and Dr. Wilson could not detect the fetal heart sounds. I saw the patient December 14. The abdomen did not seem to be as large as at the last visit. There had been a cessation of the fetal movements and I was unable to hear the fetal heart beat. The patient was kept under close observation.

December 18 the right limb began to swell and well-marked phlegmasia dolens developed. The patient suffered much pain and had considerable fever. A week later the left leg took on the same condition. Under appropriate treatment these lesions subsided. In the meantime the abdomen diminished in size and the fetal parts could be distinctly palpated. The head of

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the fetus lay well on the right side and could be felt as a hard ball midway between the umbilicus and crest of the ilium, and the body could be traced around to the top of the mass, so we concluded the placenta was beneath the fetus.

She came to my hospital January 5, 1899, and was operated upon January 7, 1899. Upon opening the abdomen there was found a large, fleshy-looking tumor, occupying the lower two-thirds of the abdomen and slightly more prominent on the left side. The uterus was attached to the anterior surface of the tumor by bands of adhesion.

After carefully studying the case I concluded to enucleate the sac. The tumor (fetus and envelope) seemed to have a covering above, and there was a space between the uterus in front and intestines behind of four or five inches, over which was spread this covering of the sac. The tissue composing this covering was very vascular and looked like thickened musculo-peritoneal tissue. I believed it to be a portion of the broad ligament or an expansion of the left Fallopian tube. It proved to be both. It was cut through and a finger slipped under it between it and the sac proper, from which it was readily separated.

An incision about five inches long was now made through this covering, diagonally across the top and in front of the tumor from intestinal attachments behind to uterus in front, and the process of enucleation begun and carried forward.

The fetal envelope was tough and but slightly adherent to the outer envelope. There was no difficulty in separating the uterus from the mass in front, and it was noticed, as enucleation was carried forward, that the musculo-peritoneal covering before referred to disappeared everywhere as a covering of the sac, except upon the anterior and extreme left surface and upon the upper and free surface of the tumor. The tumor behind was surrounded by agglutinated intestine and omentum. Upon the right side of the sac there was a similar covering of adventitious tissue attached to the colon and cecum. In front the musculo-peritoneal covering was continuous with the left horn of the uterus. The uterus occupied a position in front of the sac to the right of the median line and was separated from the sac by adventitious tissue only, and the lower portion of the sac seemed to rest upon the pelvic tissue; so we had to deal with a case of tubal gestation which ruptured at eleven weeks, the products of gestation escaping into the pelvic cavity and there finding lodgment and attachment. It retained its vital-

ity and went on developing as a tubo-pelvo-abdominal preg-
nancy.

During the process of enucleation we accidentally ruptured
the sac and a small amount of fluid escaped, so we deemed it
wise to remove the fetus, when we continued enucleation, re-
moving the entire sac.

In lifting up the sac from the pelvis a portion remained ad-
herent and was torn off. It was afterward stripped from its
attachment. There was no frightful hemorrhage, but a con-
siderable amount of oozing from the bottom and sides of the
pelvis. This not being checked by hot sponge packing, it was
deemed advisable to pack the cavity with iodoform gauze,
bringing one end out of the lower angle of the incision.

As we reached this stage of the operation the anesthetist
reported that the patient had collapsed suddenly, and we were
compelled to suspend operating for a few moments to assist in
restoring the patient. The means we employed were the sub-
cutaneous transfusion of eight ounces of normal salt solution,
a hypodermatic injection of strychnia, and lowering the head.

In our haste to close the abdomen we neglected to stitch the
sac to the incision, and this was the cause for some anxiety,
our fear being that so large a raw surface was left that we
would be likely later to encounter obstruction of the bowels
through intestinal adhesions. Happily our fears have not
been realized. The patient was put to bed in fair condition
and made an uninterrupted recovery, leaving the hospital at
the end of the fifth week.

The proper treatment of ectopic pregnancy after the sixth
month, when the child is still living, is still under discussion.
This paper is written for the purpose of considering one phase
only of the subject, viz., Shall operative intervention be insti-
tuted during the period of viability of the child, or shall we
await the death of the child and the cessation of the active cir-
culation of the placenta, then operate?

The settlement of this question must hinge upon the relative
mortality to the mother of the different procedures. The ec-
topic infant is of such low vitality and so frequently deformed
that if to rescue it greatly jeopardizes the life of the mother,
then ethically one must withhold the hand and permit it to die
that the greater life may be saved.

Such have been the sentiments of the writer for many years.
Until within the last few months all published statistics the
writer has been able to study have shown a larger percentage

of recoveries to mothers when the fetus was allowed to die and the mother operated upon later. The tables of Bland Sutton in the last edition [1] of his book clearly point to the greater safety of this method.

The writer has had three cases of ectopic gestation at or near full term. In the first the operation was done during spurious labor at full term. In this case, although fetal movements were detected one hour before operation, the child never breathed after removal by abdominal incision. The mother died the eighth day after operation, of hemorrhage resulting from the removal of the placenta, which was left at the time of the initial operation. The placenta was removed thus early in consequence of impending death from septicemia. This case was operated upon at the City Hospital September 14, 1895. A detailed history of the case was reported to the Marion County Medical Society, and at the same time the specimen was exhibited.

The second case was one operated upon five months after spurious labor occurring at full term. The fetal movements ceased at the time of spurious labor. The fetus and sac were completely removed through an abdominal incision and the mother made a good recovery. This case was reported in a paper published in THE AMERICAN JOURNAL OF OBSTETRICS. volume xxxvi., No. 1, 1897. The third case was the one the history of which I have read to-day.

The writer felt very well satisfied with the results in his last case until he saw, later, Harris' table in Kelly's recent work and Ayers' table in February (1899) number of the *Obstetrics*. These tables show clearly the decrease in mortality of late years when the operation is done with a viable fetus.

The tables are, however, both incomplete, as all tables purporting to be a summary of the world's history of work done in any particular line, especially when they comprise so long a period of time as that included in the two tables referred to. As evidence of the incompleteness of these tables, compare the tables of Harris and Ayers for the years 1894, 1895, 1896.

Harris tabulates 13 cases with 3 maternal deaths and 10 maternal recoveries when the operation was done during the viability of the fetus. For the same years Ayers tabulates 7 cases not included in Harris' table; of these 7 cases there were 3 maternal deaths and 4 recoveries.

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[1] " Surgical Diseases of the Ovaries and Fallopian Tubes, including Tubal Gestation," pp. 315, 317.

The writer of this paper has collected from reliable sources 5 other cases reported during the same period and operated upon under similar conditions. Of these 5 cases, 4 mothers died and 1 recovered. By combining the tables we have reported 25 cases in all operated upon during the three years mentioned. Fifteen mothers recovered and 10 mothers died, the percentage of recoveries of mothers being 60.

Again, in Ayers' table for the years 1894, 1895, 1896 is given a list of 16 cases operated upon at varying periods after the death of the fetus. Of these cases 10 mothers died and 6 recovered. The writer has to add to this list 17 other cases reported during the same years. Of these 17 cases, 4 mothers died and 13 recovered. We have, then, by combining these tables, in all 33 cases, in which 19 mothers recovered and 14 died, thus making the percentage of recoveries of mothers 57.7 (see tables published herewith).

It seems to the writer that by combining these tables we have as near an approach to accuracy as is possible in gathering statistics from journals of all countries and languages.

If the tables do approximately show the percentage of recoveries to mothers, then we have here an answer to the perplexing and heretofore mooted question, Shall operative intervention be instituted during the life of the child or only after its death? We are not compelled to longer consider and weigh the probability of the length of life in days of the child; the safety of the mother alone demands intervention. Undoubtedly other questions will urge themselves upon us, such, for instance, as, Is it less dangerous to operate at six months or at nine months, and what treatment of the placenta yields the least mortality?

These are still under debate, but it is aside from the writer's purpose to discuss them in this paper. His only endeavor has been to strive to arrive at a correct and truthful answer of the question, Is it safer for the mother to be operated upon in a case of ectopic gestation during the viability of the fetus? He believes that the statistics he has collected and compiled are so nearly complete and correct that the answer may now be given unqualifiedly in the affirmative.

There will be undoubtedly individual cases in which the good judgment of the surgeon will direct him to await the death of the fetus. These will be exceptional cases. The rule will be to operate at or near term during the life of the child.

TUBAL GESTATION.

Celiotomy between six and nine months, child being alive.

Operator	Date of pregnancy.	Treatment of placenta.	Mother.	Reference.
Cripps....	Six months...	Left	Died	British Med Jour., London, 1896, p. 779.
Dunning.[1]	Term........	Left	Died	Unpublished.
W R. Wilson.	Term........	Left	Died	Amer. Jour. Gyn. and Obst., viii., p. 605.
A. J. McCosh	Six and a half months.	Removed.	Recovered	Med and Surg. Report Presbyt. Hosp., N. Y., 1896, p, 112.
W. F. McNutt.	Term....	Removed.	Died	Jour. Am. Med. Assoc., vol. xiii., p. 278.

Abdominal section after death of fetus, at or near term

Operator.	Fetus dead.	Treatment of placenta.	Results.	Reference.
S. W. Budd.	Four months..	....	Died ...	Va. Med. Monthly, xx., pp. 957 to 962.
S. W. Budd.	Fourteen days	Removed.	Recovered.	Ibid.
J. Philips...	Two and a half months.	Removed.	Recovered	Trans. London Obst. Soc., 1894, xxxv., p. 162.
J. M. Rector.	Three months.	Removed.	Died ...	N. Y. Med. Journal, ix., p. 648.
H. Meek....	?	Removed.	Recovered.	AMER. JOUR. OBST., xxix., p. 84.
J. W. Elliott.	?	Removed.	Recovered.	Boston Med. and Surg. Jour., cxxx , p. 260.
Vignard....	?	?	Recovered	AMER. JOUR. OBST , September, 1894.
J. A Shaw-Mackenzie	?	Removed.	Recovered.	British Gyn Jour., London, 1894-95, x., p. 341.
McClintock.	Eight months.	Removed.	Recovered.	Kansas Med. Jour., Topeka, vii., p. 15.
E. K. Ballard.	Six to seven months.	Placenta absorbed.	Died ...	AMER. JOUR. OBST., xxxiii., p. 714.
H. F. Biggar.	Term unknown	Placenta absorbed.	Recovered.	N. Am. Jour. Homeopathy, 1894, lx., p. 768.
C. F. A. Moses.	Four months .	Removed.	Recovered.	Ed. Med. Jour., xl., p. 421.
R. Ludlum..	Some time....	Left......	Recovered.	Clinique, Chicago, xv., p 471.
J. D. Griffith.	Eighteen months.	Removed.	Recovered.	Trans. Med. Association Mo., pp. 299 to 301.
F. Michinard.	Not stated....	Removed	Recovered.	AMER. JOUR. OBST., July, 1896, p. 36.
C. G. Franklin.	Term child; not stated how long dead.	Removed and sac stitched.	Died ...	British Med. Jour., l., p. 1819.
A H. F. Barbour.	Not stated Six-months fetus developed.	Removed.	Died ...	Edinburgh Med. Jour., 1894 and 1895, xl., p. 211.

[1] Reported to the Marion County Medical Society, November, 1895.

SUMMARY OF CASES REPORTED IN THE YEARS 1894, 1895, 1896.

Fetus alive at time of operation.

	No. of cases.	Mothers recovered.	Percentage.
From Harris' table [1]	13	10	
From Ayers' table [2]	7	4	
From Dunning's table [3]	5	1	
	—	—	
Total	25	15	60%

Fetus dead at time of operation.

From Ayers' table	16	6	
From Dunning's table	17	13	
	—	—	
Total	33	19	57.7%

431 NORTH ALABAMA STREET.

OBSERVATIONS RESPECTING THE SYMPTOMS AND TREATMENT OF THE MENOPAUSE.[4]

BY

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MENSTRUATION in the normal woman appears to embrace the period from puberty to the age of 45 to 50 years. The flow undoubtedly comes from the vascular tissue of the Fallopian tubes, uterus, and vagina. It lasts usually in each menstrual period from three to five days.

The functional activity of woman partakes more or less of the character of that of the females of other mammalia, and it is, therefore, along these lines of research and by observations made in this direction that many of the most abstruse and perplexing questions pertaining to the phenomena of menstruation will have to be studied for effecting their solution.

In carrying on the work of investigation of this nature, too much regard cannot be had to the influences of the impress that has been imparted to the tissues of the female sexual organs through the almost infinite number of ancestral types.

[1] Kelly's "Operative Gynecology," vol. ii., p. 459.

[2] Obstetrics, February, 1899.

[3] Accompanying tables.

[4] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

No single or limited number of classes of such agency will suf-
fice for determining the settlement of all the questions involved.
The separation of the ova from the ovary of the oviparous ani-
mals was early observed.   Separation and discharge of ova
from the mammalia take place without the direct interposition
of the male.

Menstruation has been noticed to appear without the occur-
rence of ovulation.   In such cases observation shows that there
has been some morbid condition or defect of the tunica albu-
ginea of the ovary.   This has sometimes been the result of in-
flammatory changes taking place in the ovary, causing such
thickening or alteration of the fibrous layer below the epithelial
covering as to prevent rupture and escape of the Graafian
vesicles.   Such cases are not infrequently met with, and they
require the most careful consideration as to their management.
The presence of that condition may be followed with constitu-
tional symptoms and with the discharge of blood from the
vagina, uterus, or the Fallopian tubes; but, owing to the
organic changes incident to the morbid process, the general
symptoms are liable to be more protracted and the inflamma-
tory changes of the ovary to become more deeply diffused and
of greater severity.   There is undoubtedly a close relationship
between menstruation and the discharge of the ova.

In those cases in which thickening or alteration of the tunica
albuginea has taken place, the continuance of the function, if
it is not thereby wholly arrested, is often seriously interfered
with.   This may give rise to an irregular flow, as is sometimes
seen in the younger women who suffer more or less from ner-
vous disturbance or perverted sensation.   Whether menstrua-
tion in every case is accompanied by the formation and discharge
of ova or not, it must be admitted that these phenomena are
dependent upon the results of an evolutional process that has,
though variously modified, been transmitted from the earlier
and lower forms of the mammalia.

There are numerous factors, that serve to hasten, change, or
modify the state of the organism, attending the approach of
the menopause.   The fact that it can be artificially induced or
hastened by the removal of the adnexa or by resort to other
surgical expedients, shows that the seeming regular appearance
of the menses in woman is but the exercise of a transitional
function that has obtained in the long physical history of the
race, and that the irregularity of the phenomenon is often not

so much an indication of disease as it is that the organism has been exposed to new and unaccustomed factors.

The approach of the menopause is not infrequently attended with a variety of symptoms. Besides the occurrence of flushes of heat, the digestive derangements and nervous depression, there is sometimes developed a class of perversions or prodromes that may be said to belong to the pre-menopause state. This may consist of a marked exaltation of the faculties and an exuberance of the imagination. This phase of the nervous system may supervene before the appearance of that degree of stoutness of the individual which is characteristic of commencing menstrual cessation. In not a few cases I have observed this peculiar phenomenon, and I have come to look upon it as a sign of ominous import. Outbursts of insanity may be a sequel of this condition, so also may attempts to undertake unequal tasks, the contracting of uncongenial marriage, neglect of family, the formation of the habit for the stronger stimulants, and the substitution of personal inattention for thoughtfulness, for neatness of appearance, and for the exhibition of proper domestic concern.

Undoubtedly the withdrawing to a considerable extent of the blood from the sexual system causes a greater distribution of that element to the brain or central nervous system; this may lead to an undue strain, tension of the vascular tissue of those parts, and thus lay the foundation, in impressionable or hypersensitive subjects, of premature organic and degenerative changes.

In two cases, at least, I have observed some facts tending to show that Colles' law of immunity did not obtain. In both cases the fathers had had syphilis and the children were syphilitic, but the mothers had escaped until the approach of the menopause, when marked constitutional degeneration from that infection gradually became manifest. A resort, however, to specific appropriate treatment quickly brought the disease under control.

An important symptom that should not be overlooked is the recurrence of hemorrhage after the term of menopause has been reached. When attention has been called to this feature of a case, an examination should be made in order to ascertain the exact condition of the cervix uteri and to determine whether there is any thickening, induration, or preternatural fixation of the uterus; in those cases in which there has been

extensive laceration of the cervix, either externally or within the uterine canal, evidence of seriously marked involvement should be carefully looked for.

Here it may be remarked that the advice cannot be too much repeated that all injuries or traumatic lesions about the cervix should be attended to as early as possible, lest these parts may, on account of long-continued irritation, become the seat of cancerous or malignant development. The view here stated is not a mere hypothesis, but has become an established fact from the record of numerous well-observed cases. In a series of forty-eight cases of cancer of the cervix coming under my care within a recent period, forty-four occurred in women who had sustained cervical lesions; the other four cases appeared in patients who had suffered from dysmenorrhea and from other continued uterine disorders. The above-mentioned cases could, in all probability, have largely been prevented by resort to surgical measures before the period of the menopause had been reached.

Epistaxis is another symptom I have especially observed. In those cases in which the congestion is limited to the pituitary membrane or to the smaller intracranial vessels, the condition has not proved of serious moment. In those cases, however, in which the deeper sinuses are involved or in which the suppression or cessation of the menses had been too rapid, apoplectic lesions of the brain or organs of vision have been sometimes a complication.

When nasal hemorrhage or congestion has become the precursor of such serious involvement, the adoption of a carefully restricted system of diet and the enjoining of strict abstinence from undue excitement have been found to be important helps toward the restoration of the patient's health.

Diarrhea is an affection attendant on the menopause. I have collected the histories of upward of twenty cases; in some instances the symptoms were mild, in others the morbid condition had continued for several years. Ulceration of the rectum and of the sigmoid flexure of the colon had not infrequently been the result. Distension of the intestines, pressure upon other organs, and painful gastric disorders have often characterized the complications met with. In two cases cancer of the rectum followed, one at the end of the fifth and the other during the middle of the sixth year after the occurrence of the menstrual cessation and the supervention of diarrheal disease.

Leucorrhea and post-uterine catarrh have been among the

most common class of affections incident to perversion of function for which patients have sought relief.   When such disorders have been dependent upon local lesions, early curettement, removal of growths, and repair of tissue have frequently been followed with speedy and permanent cure.

As before remarked, the cessation of the menses has been productive of psychical changes.   This alteration or loss in mental power has been made manifest by more frequent display of irritability of temper, by the occurrence of hysterical attacks, and occasionally by those of melancholia.   Change in the physique, increase of fat, and growth of hair upon the chin and face are not infrequently observed.   Pruritus vulvæ and cutaneous eruptions which appear or become aggravated are sources of much annoyance.   They arise for the most part from local neuroses or from peripheral neuritis.   Increase of sexual activity that may take place is, according to my observation, of a limited or an evanescent manifestation.   Rigidity or spasm of the recti muscles, due to tympanites or to gastro-intestinal irritation, presenting the semblance of pregnancy, may readily be diagnosticated by the employment of an anesthetic. Uterine fungosities and polypoid development are frequently the result of endometritis or uterine engorgement and may be overcome by early curettement and the application of local styptics.   Fibroid growths, which not infrequently appear during the earlier portions of the menstrual period, are probably superinduced by a preternatural development of the stromal over that of the glandular element, for the earliest traces of the sexual organs, according to Haeckel, are visible in the embryo at the point where the skin fibrous layer and the intestinal fibrous layer meet.

After the period of the menopause has arrived such neoplasms may of course be arrested in their growth, on account of the regularly recurring vascular medium being withheld or diminished.   It is during this new, altered, or lowered condition of vitality of woman that cancerous, sarcomatous, or other degenerative changes of tissue are assumed.   The liability to the occurrence of sequelæ of such a grave nature necessitates the exercise of much skill for their recognition and the adoption of decided measures of treatment for their eradication.

Early cessation of the menses may be superinduced by excessive involution of the uterus and by atrophy of the ovaries consequent on the presence of peculiar factors during parturition.   The more gradually the function of the menses termi-

nates, the milder will be the local and general disturbances. In those cases in which there is marked impairment of the health at or during the climacteric, serious pathological changes in the pelvic or abdominal organs will doubtless be found to have taken place.

At the menopause the ovaries present a furrowed and shrunken appearance from the periodical separation and discharge of the ova. In women of advanced life the ovary may appear as a mere rudiment. The vaginal introitus may become so constricted as to lose all semblance of its former size and to present in its shrunken, conical form scarcely an opening for entrance. The external cervix may close and thus give rise to an accumulation of the products of catarrh; the collection may be of the character of what is termed hydrometra or physometra, as the enclosed cavity embraces a liquid secretion or one of a gaseous formation. In one case the mass of fluid found in the cavity of the uterus between the fundus and the internal cervix was so firmly held that it could be evacuated only by resort to free dilatation and curettement of the enlarged cavity above the inner cervix. In another case the accumulation, occurring between the external and internal cervix, together with an imprisoned collection above the internal constriction (uterus bicameratus vetularum), was finally overcome by frequently repeated dilatation of the uterine canal. Retention of the form and size of the mammæ, due to increase of fat after the glandular tissue has been more or less absorbed, can be recognized by noting in examination the absence of the characteristic lobular, glandular feel which is peculiar to the normal, active mammæ.

In some cases it is not altogether easy to determine exactly the line of demarcation that separates the borders of the physiological from the pathological processes. It may be said, however, that in those cases in which no pelvic lesions exist and no effects of traumatism of parturition remain, the menopause will entail comparatively little danger, provided the change is not hastened by subjective influences and external factors. The simplest and most common of all symptoms that are experienced, as before related, are the hot flushes, the attacks of vertigo, abnormal sensations in the abdomen, in the extremities, and in the breasts; special areas of the nervous system become irregularly congested or irritated. These may be intensified by psychical influences, such as shock, fright, or the effects of mental emotion. The onset of a severe or septic

malady, as a pelvic, an abdominal, or a constitutional affection, may most seriously complicate the condition.

Much that has been mentioned will depend upon a hereditary disposition and a proneness to disease. It must be conceded that the closing of the function of the sexual activity, especially in those who have been married and who have been the subjects of parturient action, marks a most important epoch in the physical and psychical process of the individual.

825 MASSACHUSETTS AVENUE.

HEMORRHAGE AND THE MENOPAUSE.[1]

BY

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MY observation teaches me to believe that there is a very general belief among the laity that hemorrhage is a necessary concomitant of the menopause. As a consequence of this belief many women welcome the foul discharges and hemorrhages sometimes accompanying this eventful period. They are considered as messengers bringing the joyful tidings of relief from menstrual vicissitudes and of the passing away of the child-bearing period. It has for years been to me a great source of pain to contemplate the misery and hopelessness of many of the wrecks of womanhood who have thus been deluded, who have finally presented themselves to me for relief when malignant disease had advanced to that stage where operative procedures did not present a single ray of hope.

Since the last meeting of this Association eleven women, all of whom were thus deluded, have come under my care for treatment when disease had advanced to that stage where no possible relief could be offered. During this same time twenty-seven others came under my care, most of whom were likewise encouraging themselves, but fortunately sought counsel before it was too late. Eight of these twenty-seven were suffering from well-defined malignant disease, sixteen from uterine fibroids, and in three I was unable to make a diagnosis. One of the malignant cases was only 31 years of

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

age, yet she thought the change of life was working on her. Several of the others had not arrived at the proper age for the menopause, but nevertheless thought it was probably the trouble. I quote these because of their corroboration of the popular belief regarding hemorrhage and the menopause.

I appear before you to-day to discuss this subject, not because I have anything new to offer, but with the hope that I may awaken a new interest in it and help to instruct the public by aiding in a greater dissemination of facts concerning it.

I do not believe hemorrhage is a necessary concomitant of the menopause. When it does occur otherwise than as a menorrhagia in the true sense of that term, it is, in ninety-five per cent of the cases, significant of a pathological condition. A physician, to my mind, is not performing his duty to himself, to his profession, nor to his patient, when called to a case of hemorrhage of persistency, if he contents himself with a diagnosis of "change of life" and prescribes accordingly, without making a most careful physical examination of the genital organs. He should ask for the privilege of an examination, and, if denied it, he should demand it. If then refused, no sympathy, no pecuniary considerations should keep him from withdrawing from the case at once.

It is unnecessary for me to take up the time of this Association with statistics in support of my position. During the past three years I have interrogated, or had others do it for me, 482 healthy women over 52 years of age. Of these only 39 gave a history of what could be termed a hemorrhage during the menopause. and out of this number only 5 gave a history of hemorrhage of any persistency. In 187 tabulated cases between 43 and 50 years of age suffering from uterine hemorrhage, 19 were due to pregnancy, 48 to malignant disease, 53 to fibroids or uterine cysts, 10 to diseased endometrium, 26 to diseased appendages, while in 31 no positive diagnosis was made. In view of such statistics I cannot see how any physician can argue, as I have heard them do, that hemorrhage during the menopause is not as a rule significant of disease.

On the other hand, we must not be led by the absence of hemorrhage to feel secure in negative diagnosis of pathological conditions. Some of the most malignant cases I have seen never gave a semblance of hemorrhage. I have also seen fibroids, large and small, and no hemorrhage present.

I may be thought too radical in some of my views. I have

all possible respect for the feelings of woman. I honor her virtue and modesty, and would never intentionally subject her unnecessarily to an examination. I believe, however, that at any time of life where abnormal conditions arise in a woman an immediate examination should be made. Hemorrhage or no hemorrhage, apparently healthy or otherwise, it could positively do no harm for every woman to subject herself to an examination at intervals during the supposed change of life. I presume there is not one in this presence to-day who has not been called in to see women who have suddenly become alarmed at their condition. They had not noticed anything abnormal for, in many instances, more than a few days or weeks, and yet you have discovered that disease has made progress to an extent which would warrant you in the assertion that it had been of long standing. I am not one of those who believe that malignant disease of the genitalia can always be cured if seen early. I am positive, however, that in a very large percentage of cases an early operation will at least mitigate suffering and greatly prolong life. I think my experience will almost justify me in saying that they are sometimes cured, as I have one woman living eight years after a vaginal hysterectomy for cancer, two over six, two over five, three over four, and at least twenty over three years, unless some of them have died without my knowledge. At the present time it is very seldom that I operate upon an advanced case of malignant disease of the uterus and surrounding parts. I think, as a rule, it is useless and a discredit to surgery. I do not know of a single case that I have thus operated upon that has not had a return in less than a year. I do not know of one that has lived over eighteen months, and most of them have died in periods ranging from three to nine months after the operation. I know it is sometimes exceedingly difficult to make a positive diagnosis of malignancy early in the case. I presume some of my cases operated upon were not malignant. If they were not I scarcely regret it, for they were very suspicious, and they fully recovered from the operation. A few years ago I saw a woman with supposed malignant disease. Two of the best microscopists then in our city examined specimens from her. One declined to give an opinion, the other stated positively it was malignant. The woman concluded to await developments. She is living yet and well to all appearances. To me it is a question whether or not, even at the hands of the expert micro-

scopists of the present day, it is always possible early in the disease to make a positive diagnosis. Happily, however, the clinical history and gross appearances are nearly always such as to enable us to make a diagnosis. In conclusion I say emphatically: "All persistent hemorrhages during the menopause should be regarded with suspicion."

515 PENN AVENUE.

REPORT OF FOUR ADDITIONAL CASES OF UTERINE FIBROIDS COMPLICATING PREGNANCY.*

BY

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UTERINE fibroids constitute the most serious complications of pregnancy. Previous to the advent of abdominal surgery and antiseptic midwifery more than one-half of the mothers and two-thirds of the children died.[1] The labors allowed to go to a natural termination ended as fatally as did those subjected to surgical interference.[2] Careful antisepsis and improved technique have reduced the maternal mortality to 37 per cent in cases in which no interference occurred before labor.[3] The management of this grave complication is therefore still at fault. We must aim to obtain better results. The loss of mothers ought not to exceed 10 per cent. The viable children ought nearly all to be saved.

The number of cases recorded within the last ten years is as yet insufficient to enable us to formulate any fixed rules. Each case is a rule unto itself and must be managed in accordance with the best interests of the mother and, when possible, of the child. In placing on record these additional cases together with abstracts of those previously reported,[4] and in submitting to your consideration their management, good or bad, the object of this paper will have been accomplished.

For convenience of discussion the report is classified under arbitrary headings, some cases belonging to two or more subdivisions.

I. BEFORE DELIVERY.

(a) IN THE INTEREST OF MOTHER AND CHILD. 1. Non-Intervention.—We have all seen subperitoneal fibroids of the

* Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

uterus, especially smaller tumors, that have not only not been a hindrance to delivery, but have apparently disappeared after labor. Such are not considered as complications.

We also know that in the early months of pregnancy it may not be possible to decide whether a certain tumor will become a hindrance or be safely displaced. The decision may be arrived at later on, or not until the onset of labor. Softening, compression, and retraction of apparently immovable fibroids are on record. But whenever, on account of its location, the tumor will not interfere with delivery, or when its moderate growth will admit of delay until after the viability of the child, a conservative course is clearly indicated.

CASE I. (abstract).—The patient was seen in consultation in October, 1893, when four months pregnant. She was 34 years old and had had three children. The tumor was of two years' growth and occupied the smaller half of the right pelvis and iliac fossa. It did not seem likely to obstruct delivery. I advised non-interference. She was delivered at term, without difficulty, of a healthy child. Hysterectomy was performed successfully nine months later for profuse hemorrhage and intense pain.

Advice in accordance with the rule above quoted was given in three other cases. In two (Cases 3 and 4) it was not accepted, and in one (Case 5) postpartum complications developed. These three cases are therefore reported under other headings.

2. *Myomectomy.*—Myomectomy for pedunculated fibroids is as safe in its results as is ovariotomy under the same conditions. The enucleation of fibroids has been followed by abortion in quite a proportion of cases; according to recent statistics there were eight abortions in twenty-one myomectomies.[5] The indications are therefore limited. Myomectomy may be indicated after viability of the child, in preference to hysterectomy, when it is desirable and possible to preserve the uterus, or during labor when myoma of the cervix obstructs the pelvis and cannot be dislodged.

3. *Porro Operation.*—After viability of the child or at term, if the tumor obstructs delivery and if the uterus must be sacrificed, the Porro operation has hitherto proved the safest procedure.

4. *Vaginal Cesarean Section.*—Dührssen's[6] successful delivery of a woman at term through the cervix uteri bisected in its antero-posterior diameter has encouraged him to propose a like delivery in certain cases of myoma low down in the uterus. His advice has not yet been followed.

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(b) IN THE INTEREST OF THE MOTHER. 1. *Induction of Abortion.*—If the child must be sacrificed the choice lies between abortion and hysterectomy. To my mind the accidents attending hysterectomy can be more readily controlled than can the complications of an abortion, in which the hemorrhage may become fatal or the fibroids may slough and lead to sepsis. Often an abortion is impracticable because the cervix is beyond reach. Among the cases reported as having aborted the death rate has been twelve per cent.'

2. *Hysterectomy.*—There are cases in which, on account of intolerable distress from abdominal distension or pressure, or from interference with vital functions, or from constant, intense anxiety, we are obliged to do a hysterectomy as an emergency operation.

CASE II. (abstract).—The patient was seen in October, 1891. She was 41 years old, had been married twelve years, and had never been pregnant. She had been regular until five months ago, since which time the menses had failed. She had been aware of the presence of a tumor the past two years. The recent rapid growth of the tumor and the distress from fulness of the abdomen had caused her to seek relief. The diagnosis was tumor with pregnancy. The patient thought she was entering on the menopause and would not listen to the suggestion of pregnancy. She insisted on any operation that offered speedy relief. Supravaginal amputation was made and the stump was secured by serre-neud. The tumor was a multi-nodular fibroid containing a fetus of about five months. The patient died septic.

Again, there are tumors located in the lower segment of the uterus, or in the anterior lip of the cervix, or in the broad ligament, which encroach on the pelvic space and constitute a barrier to safe delivery. Delay until viability of the child may be possible at an increased risk to the mother. What advice shall we give? It has been my rule to state the facts to the patient and her friends, and to let her decide whether she will accept the additional risks or whether she prefers hysterectomy regardless of present or future motherhood. In both the cases reported the decision was against delay, though neither of the women had as yet had a child.

CASE III. (abstract).—The patient was seen in December, 1895. She was 37 years old, married twelve years. She knew she had a tumor the past three or four years. She had not menstruated for four months and noticed she was rapidly

growing larger. She had consulted a surgeon, whose attempt
to bring on abortion had failed. The tumor filled the pelvis,
extending upward to the umbilicus. The cervix was close to,
but high above, the symphysis. Diagnosis: uterine fibroid
with a four-months pregnancy. My advice to delay until
after viability of the child was rejected and immediate radical
operation demanded. Supravaginal hysterectomy was suc-
cessfully performed. The pregnancy was in the upper part of
the uterus, the tumor in the lower. The patient is now (four
years later) in better health than ever.

CASE IV.—Referred by Dr. W. H. Wirt, Loudonville, O.
Mrs. H., age 28; married nine years, never pregnant; menses
regular, profuse, five to eight days. The patient is of spare
build, somewhat anemic, otherwise of healthy appearance.
She first consulted her physician in November, 1897, for hypo-
gastric pain night and morning, with nausea and vomiting.
There was at that time some pelvic tenderness and a bulging
of the posterior uterine wall, which felt harder than a normal
uterus. She improved on treatment and was not seen again
until recently.

At the time of consultation she had missed a period and was
three weeks past her time, having a slight bloody discharge,
pain, vomiting, and nausea, resembling the symptoms of last
year. The pelvic mass is movable as a whole, has a hard pos-
terior bulge depressing the vaginal vault, is of the size and
shape of an elongated cocoanut, with distinct groove or depres-
sion at the fundus; the left half is soft, the right is as hard as
the posterior bulge and lower segment of the cervix; the latter
is slightly patulous. Diagnosis: uterine fibroid complicated
by early pregnancy. After receiving an unbiassed statement
of her condition and prospects, the patient insisted on hyster-
ectomy as her choice.

Operation June 23, 1898. Suprapubic hysterectomy accord-
ing to the Baer method. Recovery without incident. The
softened and enlarged uterus contained numerous interstitial
smaller tumors and two of the size of a hen's egg. In a niche
above, near the left cornu, there was an ovum still surrounded
with chorionic villi. There was no placenta. The tumors in
the right and posterior segment were incorporated in the pos-
terior uterine wall.

II. AFTER DELIVERY.

(a) NON-INTERVENTION.—We presume that no one would

unnecessarily meddle with a case after safe delivery. One is, however, liable to be called upon to check a violent postpartum hemorrhage or to deal with a septic uterus.

These sequelæ may be controlled by the means usually applied when no tumor is present, but must in some instances be promptly and radically dealt with. In the following case, which has already been referred to above under the heading of non-intervention during pregnancy, we have exemplified both complications, hemorrhage and sepsis, the latter too profound to admit of radical measures.

CASE V. (referred by the late Dr. G. A. Orwig).—Mrs. M., age 38; married sixteen years; two children, last child 2 years old. Menses always profuse, one week, with bearing-down pain, but worse after birth of second child, which was weaned in November, 1897. On account of irregular hemorrhages and abnormal condition in her abdomen, I was asked to examine her in January, 1898, the attendant suspecting extrauterine pregnancy.

The abdomen corresponded in size to a five- or six-months pregnancy. Behind the symphysis pubis and toward the left side of the pelvis there was a hard tumor of the size of a fetal head. Apparently closely attached to the right of this body there was a softer, fluctuating, oval tumor extending into the right flank. There was no bulging into the vagina. Cervix soft, displaced anteriorly. Diagnosis: pregnancy complicated by a tumor. Advised non-interference.

On July 12 the patient was delivered of a healthy child at term. Within the first half-hour she was taken with a severe postpartum hemorrhage which her attendant could not control. When seen by me she was blanched and still bleeding freely. After flushing the uterus with hot water and packing with gauze, the hemorrhage ceased. The tumor proved to be an intramural fibroid, which had caused a tedious labor and afterward had prevented prompt contraction of the uterus.

A few days after confinement the patient became septic, her pulse ranging from 115 to 130 and the temperature from 101° F. to 104° F. At the end of three weeks, her condition growing constantly worse, she was sent to the hospital with a view to surgical relief. I had not seen her in the meantime. I found her emaciated; her pulse was small, compressible, 126 to 134; the temperature was 102° F. to 103° F. She had frequent profuse sweats; there was a purulent vaginal discharge.

I did not deem her condition at all reassuring for operative intervention, and therefore treated her as I would any other case of profound sepsis. She gradually improved. At the end of three weeks she was discharged to complete her convalescence at home. I called on her recently to ascertain her present state. She says she feels better now than ever. She does all her own work except washing and heavy lifting. She does not flow as profusely nor quite as long as formerly. The tumor is hard, movable, not painful, occupies the left pelvis, and reaches about two inches above the level of the pubes. There is no vaginal discharge.

(b) HYSTERECTOMY, indicated by: 1. *Recurrent Hemorrhage.*—Postpartum hemorrhage need not take place at the time of confinement, but may set in during the puerperium and may continue to recur, compelling ultimate recourse to hysterectomy. In non-septic cases this involves no more than the ordinary risk of suprapubic amputation.

CASE VI. (referred by Dr. G. R. Feil).—Mrs. C., age 38, married thirteen years; no children; four miscarriages at from four to six months; menses regular, profuse, seven days. Previous health good. Was delivered of a seven-months living child four weeks previous to my seeing her in consultation. She had been taken with a severe hemorrhage, supposed to be due to retained placental remnants. Under anesthesia digital intrauterine exploration revealed the presence of a sessile, submucous fibroid on the posterior wall, about four inches in diameter. A smaller subperitoneal tumor was felt on the anterior wall. The hemorrhage was controlled by curetting and packing of the uterine cavity. The subsequent treatment, by rest and internal medication, proved of only temporary benefit, the hemorrhage recurring. The patient became extremely nervous and demanded operative relief. Operation December 24, 1896. Suprapubic hysterectomy, Baer method. Recovery uneventful. The patient is now in excellent health. The child is alive and strong, though its development is slow. The tumor in the posterior uterine wall was a myoma about as large as a medium-sized cocoanut. There was a small fibroid in the anterior wall and one just above the bladder. The right ovary was cystic.

2. *Septic Infection.*—The tumor may slough or become infected, or the placenta may be retained, undergo putrefaction, and cause acute sepsis.

If the infection is local, hysterectomy is the treatment by choice. If general, one must be guided by the conditions surrounding the case.

No time ought to be lost in attempts to remove a putrid placenta from a fibroid uterus, if situated beyond the tumor and difficult of access. The chances for life are improved by removal of the uterus, including tumor and placenta, provided the infection be still circumscribed. If the infection has gone beyond the pelvic limit my own inclination is against surgical measures, which only add the elements of shock and hemorrhage to the already debilitated condition caused by the sepsis. When we cannot tell whether or not the infection has crossed the line, the patient is entitled to the benefit of the doubt by immediate operation.

Case VII. (referred by Dr. I. Friedman).—Mrs. P., age 32, married six years; one child four years ago. Menses usually last ten days; they are profuse and attended by bearing-down pain. Dr. Friedman had diagnosticated uterine fibroid nine months ago and had advised operation, which was declined. Late in the fall of 1897 the patient became pregnant, and on May 3, 1898, she miscarried at five and a half months, having felt life for five or six weeks. Dr. Friedman first saw her on May 5 and found her with a temperature of 103° F., retained placenta, distended abdomen, and rapid pulse, the os uteri admitting two fingers.

In consultation on the eve of May 6 I found a slim, pale woman with small, rapid pulse. The temperature was 104° F. The abdomen was enlarged by an indented tumor rising from within the pelvis to two inches above the umbilicus. The larger half of the tumor was on the right; it was rounded, hard, somewhat movable. The smaller was on the left; it was smooth and soft. The os admitted two fingers; the placental tissue was barely within reach. The discharge was free and quite offensive. I regarded hysterectomy as a forlorn hope and so advised. Operation May 7, 1898. Suprapubic hysterectomy, Baer method. Abdomen closed without flush or drain. The patient came off the table in fair condition. In the evening her pulse was 104; after midnight the pulse, though not increased, was decidedly weaker. Submammary saline injections, and finally intravenous transfusion, were made during the following day with but temporary improvement. The patient died suddenly thirty hours after operation with symptoms of heart failure. There was no autopsy. The tumor

was a submucous, sessile fibroid in the right posterior uterus, with a decomposing placenta in the upper part of the left uterus. The Baer operation was selected to save time.

722 Woodland avenue.

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TWO CASES OF DYSTOCIA FOLLOWING VENTROFIXATION, ONE REQUIRING CESAREAN SECTION.[1]

BY

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In quite a considerable number of ventrofixations performed by me I have accurate knowledge of at least five patients who subsequently became pregnant and were delivered at term. Three of these had normal gestations and labors. In one, not strictly belonging to this class, in which the uterus was fastened to the abdominal wound after myomectomy, with extraperitoneal treatment of pedicle by means of an elastic ligature, the fundus sloughed, resulting in an abdomino-uterine sinus which persisted during pregnancy, and through which there was a periodical, more or less profuse bloody discharge from the placenta. The patient was delivered of a living child three weeks prematurely; the child survived and the mother made a good recovery. The fifth case is one of the two cases of dystocia which I am about to report.

Case I.—Mrs. M. Z., age 37; seven children, last one ten years ago, which was still-born. She was admitted to Mercy Hospital, March 15, 1896, with history of menorrhagia of ten years' standing, menstruation lasting a week or more, leucorrhea, constipation, headache, backache, and bearing down. When in erect posture a large mass protrudes from the vagina.

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

On examination the uterus, with anterior and posterior wall of vagina, was found protruding from vulva, there being an almost complete inversion of genital canal; os was patulous, cervix eroded, perineum lacerated. March 19, 1896, the following operations were performed at one sitting and in the order enumerated : curettement ; anterior colporrhaphy (Stolz' operation); median celiotomy, two-inch incision; ventrofixation, fundus being anchored to muscle and fascia at lower angle of wound by three buried silkworm-gut sutures passed through posterior surface of the fundus just below insertion of the tubes; Emmet's colpoperineorrhaphy. Convalescence normal; discharged April 20, 1896.

On Sunday, September 18, 1898, my assistant, Dr. F. F. Simpson, was called to her in consultation by Dr. Potts and learned that labor had begun about a week before and that, according to her statement, amniotic fluid and meconium had escaped at that time. Pains were persistent, though not uniformly severe till Thursday night, when they became stronger, and the uterus remained in a condition of firm contraction thereafter. Temperature became elevated, pulse 110 to 120. Sunday night she had a chill, temperature reached 103°. It was then decided to take her to the hospital. When seen by me on Monday morning, September 19, temperature was 99.8°, pulse 120 but good; general condition good; she had had few pains during the night. Her uterus was in firm tetanic contraction, spherical in shape, extending to mid-point between umbilicus and xiphoid, fundus protruding anteriorly to a marked degree. Fetal head recognized with difficulty to right of and on line with umbilicus, but the uterus was too firmly contracted to outline position. By the usual vaginal examination the cervix could not be reached, but above the promontory of sacrum a thick, firm mass protruding into anterior vaginal wall was felt. Under chloroform the cervix was found to be posterior and eight inches from vulva; repeated efforts to draw it down were of no avail. There was no evidence of fetal life; the vaginal discharge was much discolored and offensive.

In view of the prolonged labor and the evidence of septic infection, as well as the firm tetanic uterine contraction threatening rupture; the high position of the cervix, which was not dilated above the size of a silver dollar, and which could only be reached under anesthesia with the whole hand introduced into the vagina; the futile attempts to bring it down or to reach the fetal extremities through it; in addition to the hard

tumor-like mass behind the symphysis, evidently the imprisoned anterior wall of the uterus obstructing the pelvic canal—the only solution of the difficulty seemed to be Cesarean section. She was, therefore, prepared for operation. The last examination was made between 10 and 11 A.M. At 12 o'clock the pains became more severe and frequent; at 2 P.M. she was anesthetized and placed upon the table for section. When the vagina was being cleansed on the operating table the breech was found presenting at the pelvic outlet. She was, therefore, transferred into another room, where the dead fetus was rapidly delivered. The patient was septic, and had more or less elevation of temperature for over a week, but she finally made a good recovery. Some of the gentlemen of this Association, which held its meeting at the time in Pittsburg, and who saw the patient on the operating table, will no doubt remember this interesting case. How spontaneous delivery was accomplished at the last moment, in the face of apparently insuperable difficulties, is certainly a very interesting question. The only explanation which I could advance is that the very powerful uterine contractions present during the last two hours caused a rupture of some of the adhesions binding the uterus to the abdominal wall, releasing the imprisoned anterior uterine wall and allowing the cervix to descend into the sacral excavation. It was certainly a very fortunate termination of a case in which a Cesarean section, on account of the existing infection, might have proved very disastrous.

CASE II.—Mrs. P., 24 years old, married ten months; puberty at 15 years; menses regular, of four days' duration. About five years ago she gave birth to a child; shortly afterward began to have considerable pain in back and legs, menses rather profuse and painful. She had uterine procidentia, for which a surgeon of repute performed several plastic operations in conjunction with a ventrofixation four years ago. She left the hospital before her abdominal wound was healed. During her pregnancy she suffered considerable pain more or less constantly after the third month. She fell into labor at 10:30 P.M. of March 1, 1899. The pains were very strong but ineffective. Examination by Dr. Rectenwald the next day under anesthesia showed cervix high up posteriorly, undilated; the fundus was down anteriorly. Several unsuccessful attempts were made by Dr. Rectenwald to bring the cervix down. He finally advised removal to the hospital for Cesarean section. She was admitted to Mercy Hospital March 2, 1899, at 7 P.M. Exami-

nation showed abdomen distended to a degree expected from gestation at term, not symmetrically, however; the highest point of the uterus did not reach higher than the umbilicus. Apparently the long axis of the uterus was obliquely across the abdomen, the point of the fundus being about three and a half inches above the symphysis and two inches to right of median line. The cervix was about on a level with the pelvic inlet and occupying a position to the left of the promontory of the sacrum. The long axis of the fetus was in the same direction, the head being in the lower segment of the uterus. Below the point of uterine attachment to the abdominal wall the abdominal parietes were very tense, and the relaxed abdominal wall above the attachment was loosely folded over the point of greatest tension. The cicatrix was broad, irregular, and puckered at several points.

Vaginal examination showed anterior lip of the cervix about six inches from vulva and occupying a position in the pelvic inlet to the left of the promontory of the sacrum. The anterior wall of the uterus was firmly contracted, located behind the symphysis, and very thick, suggestive of a neoplasm, but its true nature was recognized. When admitted to the hospital no fetal heart sounds could be heard and no movements felt, though Dr. Rectenwald was able to obtain both before removal to the hospital. Pulse was about 90, temperature normal, pains frequent, her sufferings being very intense. There was evidently nothing else to do but a Cesarean section, as it was impossible to change the position of the cervix situated to the left of the sacral promontory. Fetal parts could not be reached per vaginam even under anesthesia.

Operation at 9 P.M.; ether anesthesia; five-inch incision in middle of abdomen (which, however, was not the normal median line, for that was drawn to the right), beginning four inches from symphysis and extending to umbilicus; increased one inch beyond the umbilicus; the cavity protected by pads packed around the uterus. Four-inch incision made through uterus at a point a little to the left of the median line, beginning at about an inch anterior to the transverse line between tubal ostia, and extending it three inches through the fundus into the posterior wall of the uterus, which was presenting. Placenta was found attached directly beneath line of incision. It was quickly detached, the amniotic sac ruptured, the uterine opening enlarged posteriorly by tearing, the arm caught, and the child quickly extracted. The uterus was then rapidly

delivered and cervix grasped and compressed, thus preventing the loss of an ounce of blood. The child was then placed in the hands of an assistant and the pelvic cavity packed with pads. The uterus was dissected loose from the abdominal wall in front, the torn attachments being very firm, extending over an area fully two and a half inches in diameter, involving even the bladder, the peritoneum of which was wounded and had to be approximated by catgut sutures.

The uterus was then carefully examined. The anterior wall was a large, raw, lacerated surface marked by almost total absence of normal muscular structure, which seemed to have been replaced by connective tissue; it was at this area only one-third of an inch thick, whereas the remainder of the wall contracted to a thickness of one and a half inches. It would have been impossible to bring the peritoneal edges together, covering this extensive wound, without excising the whole uterine cicatrix. This was not thought advisable, partly from fear of infection which might have already occurred, partly from the condition of the patient, whose pulse was now 120, and more particularly because of the doubtful effect of such a procedure on future pregnancies. A Porro operation was, therefore, decided upon, the technique adopted being the Baer method of hysterectomy as practised by me for removal of uterine fibroids. The operation proved a very simple and rapid one. The patient made an uninterrupted recovery and was able to leave the hospital at the end of five weeks.

In regard to the technique adopted in my four cases, excluding the myomectomy, followed by pregnancy and delivery at full term. it was that of ventrofixation in contradistinction to suspensio uteri, anchoring the fundus to the abdominal wound by two or three silkworm-gut sutures passed through muscles and fascia and through the fundus uteri, beginning at a line between the tubal ostia, the second suture about one-quarter of an inch down on the anterior uterine surface, including about one inch of uterine tissue. In the first case of dystocia reported this technique was somewhat changed, inasmuch as the first suture was passed between the tubal ostia and each succeeding one about one-quarter of an inch apart in the posterior wall of the uterus, the anchorage at the same time having been broader and wider than on previous occasions, for the reason that I was anxious to make a firm fixation to hold up the large, heavy uterus. This broad attachment including a portion of the posterior aspect of the fundus during gestation,

no doubt not only interfered with a proper expansion of the anterior uterine wall and fundus, but they together formed in addition a tumor blocking up the pelvic inlet during labor.

In the second case I learned from the operator that the fixation sutures were passed through the anterior wall of uterus near the fundus, but an infection occurred, resulting in very extensive, firm, unyielding adhesions between the abdominal wall and the fundus uteri.

The terms ventrofixation and ventral suspension or suspensio uteri are frequently used promiscuously. To avoid misunderstanding, I wish to say that by ventrofixation I mean an anchorage of the uterus to the abdominal wall by sutures which include parietal muscles and fascia—in other words, fixed tissues; while suspension is an attachment to the loose abdominal peritoneum and subperitoneal tissue only. The paper deals with the first method, or ventrofixation, exclusively. It is not intended to discuss the relation of the operation to dystocia at length, as this has been done very ably and thoroughly by writers abroad as well as in this country. My object in presenting this paper was not only to place on record these two very interesting cases, but also to invite a discussion on some points of great practical importance to every operator.

It would be neither fair nor just to use the cases just reported as serious arguments against ventrofixation. A careful study of them will show, as I will freely confess, that not the operation, but the technique, was at fault. In my own case my anxiety to secure the permanent retention of the inverted pelvic organs within the pelvic cavity led me not only to make a very broad attachment between the fundus uteri and the abdominal parietes, but also to include a portion of the posterior surface of the fundus in this anchorage. While this is perfectly permissible and proper for operation for uterine prolapse after menopause has set in, during the child-bearing period it becomes dangerous, as it allows of expansion of the posterior uterine wall only, and not of the fundus and anterior wall, which, though participating in the general hypertrophy of pregnancy, are held down by the sutures and block up the pelvic inlet during labor. A less broad attachment, as I have learned since, including only about half an inch of uterine tissue, or even less, with the sutures passed through the anterior uterine wall, the upper or first suture beginning at least half an inch below the tubal insertion, would have been quite sufficient to

fix the uterus permanently to the abdominal wall, provided the sutures had transfixed the fascia. Such a fixation would not interfere with the expansion of the fundus and a large portion of the anterior uterine wall. It would, therefore, avoid the dangers of dystocia.

In the second case the technique was faulty because the operation was followed by infection and suppuration, resulting in very extensive and unyielding adhesions, binding a large portion of the fundus and the whole anterior uterine wall firmly against the parietes.

It is, therefore, evident that in order to prevent such distressing consequences following this operation during the child-bearing period, a very careful and exact technique is essential. A searching study of the cases of dystocia reported as due to ventrofixation would probably discover just such flaws in the technique as have been described in these two cases. Instead of being an argument against ventrofixation, these cases, therefore, merely demonstrate the necessity of greater care in the performance of this operation, as well as a more careful selection of the cases for it.

This brings me to the question, When should ventrofixation be performed? I will not discuss the relative merits of shortening of the round ligaments and uterine suspension for ordinary cases of retroversion and flexion; both have their advantages and disadvantages, but I believe one or the other of these operations quite sufficient for the relief of these conditions, with perhaps very few exceptions. Ventrofixation has a place, however, and a very important one in my opinion, in the treatment of prolapse of the uterus, and especially in the extreme forms of procidentia or complete inversion of the pelvic organs. Neither Alexander's nor the intraperitoneal shortening of the round ligaments nor suspensio uteri will hold up the uterus and resist its downward tendency to the same degree as ventrofixation. When combined with the necessary plastic operations on the cervix and the vaginal outlet, ventrofixation, in my experience, has proved the ideal operation for this extremely miserable condition. In some fifteen or sixteen cases of the aggravated form of procidentia uteri in which this combination of operations was performed, I have not had a single failure nor, to my knowledge, a recurrence. I have only found it necessary to do hysterectomy in one case in which the condition of the cervix was strongly suspicious of malignant

disease, and in this I performed Fritsch's operation of vaginal hysterectomy with resection of anterior and posterior vaginal walls.

Another class of cases in which ventrofixation is preferable to suspension or shortening of the round ligaments are women suffering from posterior uterine displacements complicated by chronic metritis with a marked enlargement of the uterus. The weight of the hyperplastic organ will soon draw out the suspensory ligament, after suspensio uteri, to such a length that it is no longer capable of holding the uterus up in ante-position, but in spite of this attachment, if it has not given way, it will sink back into its old malposition. The round ligaments also become stretched in the course of time as a result of the constant dragging upon them, and the uterus will recede more and more from its natural position behind the symphysis. A ventrofixation, however, when properly done, may invert a weak, flabby abdominal wall to a certain extent, as seen by me in one case, but it will remain in contact with the uterus.

In conclusion, I wish to say that while suspensio uteri and shortening of the round ligaments have largely taken the place of ventrofixation during the child-bearing period in the treatment of ordinary displacement, and very properly so, I believe the latter still the operation of election in the more aggravated forms of procidentia uteri, and also in those retrodisplacements of the uterus where the latter has become greatly increased in volume as the result of chronic metritis. These are the conditions usually accompanied by much suffering and distress, to the extent frequently of incapacitating women from work. Restoration to health and usefulness can be accomplished by ventrofixation and the necessary plastic operations in the vagina. These operations can be done even during the childbearing period without fear of endangering future pregnancies, provided careful attention is given to a few important details in the operative technique, as pointed out above. The numerous cases of normal labor and spontaneous deliveries following this operation are proofs of this statement. The cases of dystocia reported are, in a great measure at least, the result of the faulty technique used, as has been shown in two cases presented to you in this paper.

524 PENN AVENUE.

A SIMPLE, EFFECTIVE, AND ESTHETIC OPERATION FOR SHORTENING THE ROUND LIGAMENTS.[1]

BY

H. W. LONGYEAR, M.D.,

Detroit.

(With three illustrations.)

THE object of this paper is to describe and commend to the profession an operation for shortening the round ligaments which the writer believes to be the best method which has been placed before the profession.   The broad subject of retrodisplacements of the uterus and the various abdominal and vaginal fixation methods advocated for their correction will not be entered upon, as this operation is designed to do only what Alexander proposed to do in his operation, but in a manner more expeditious, certain, and less dangerous to the patient and the integrity of the parts.

In calling attention to the operation there will be nothing original advanced by me, excepting in some points of technique.   The operation having proved eminently satisfactory in my hands, and believing, from the dearth of literature on the subject, that it is not generally understood or its true value appreciated, and that there is a crying need for some such method of shortening the round ligaments to supersede those of a more or less elaborate and mutilative character, is my excuse for presenting it at this time.

To some of you the operation is doubtless familiar.   It was first brought to my attention by Dr. J. H. Kellogg, of Battle Creek, Mich., in a paper read at the annual meeting of the Michigan State Medical Society in 1897.   Soon after this, appreciating the correctness of the theory of the method, I attempted it myself, but did not succeed in finding the ligaments according to his directions until I had seen him perform the operation.   Its points of merit are, briefly, short skin incision; bloodless field; no mutilation of either ring and no slitting up of inguinal canal, and consequently no danger of future

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

hernia; method of anchoring ligament accomplished by use of
but one stay suture; no tissue is cut away; the ligament can
always be found; the operation can be made in a short space
of time, and the patient can be allowed to get up sooner than
with other more mutilative operations.

After the preparation of the patient, which should be by
first shaving the pubes, and otherwise in every particular as
for an abdominal section, the operation in brief consists of the
following steps:

1. The incision. This is made about an inch in length
(somewhat shorter in thin subjects), parallel with and just
above Poupart's ligament, and with its outer end about half
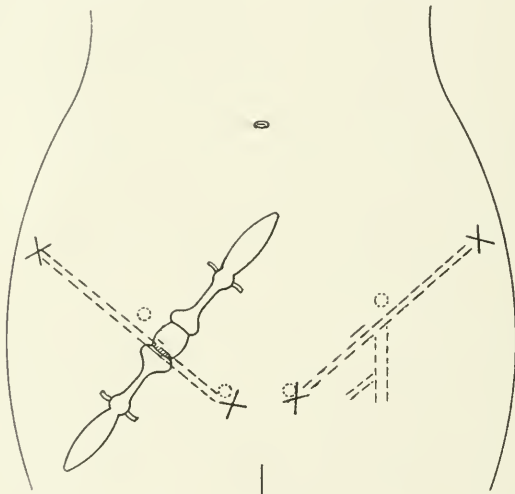
Fig. 1.

an inch inside of the internal ring. It should pass through
skin, superficial fascia, and fat, down to, but not including,
the loose tissue which overlies the tendon of the external
oblique. An incision of this length and situated as directed
will be practically bloodless. If begun too far back, a branch
of the superficial epigastric artery may be severed, and if too
far forward a branch of the superficial external pudic artery
will be encountered; while if carried beyond the layer of fat,
veins will be cut, which will cause the field of operation to be
more or less obscured. *The location of the internal ring is
determined by the pulsation of the femoral artery, which
passes just under it* (Fig. 1). (Dr. Kellogg locates it by
measurement.)

2. The separation of the wound transversely by the use of eye-retractors mounted on long handles.

3. Clearing away the loose tissue overlying the tendon of the external oblique by pulling it from side to side, longitudinally with the wound, with blunt hooks, and catching with the retractors each successive layer as it is raised up by the hooks. The blood vessels in this tissue are thus pulled back and held out of the field of operation. With the retractors holding back the tissues a field of about one inch square in size is presented, with the smooth, white, glistening aponeurosis forming the tendon of the external oblique at the bottom. Its oblique fibres can be usually easily traced to their junction with Poupart's ligament. By moving the retractors in various directions, being careful at the same time to keep the tissues within their grasp, a much wider field may be inspected if necessary.

4. Puncture, one-quarter of an inch in length, of the tendon of the external oblique, with the scalpel, at a point just above Poupart's ligament, and at the outer aspect of the cleared space (Fig. 1).

5. Insertion of the blunt hook, which should be passed downward close to the floor of the inguinal canal, then inward and upward, and the ligament with its surrounding investment of fat will be brought up out through the opening in the tendon.

6. Isolation and pulling out of the ligament, which is facilitated by stripping back the adipose and cellular tissue with blunt-pointed forceps as it emerges through the opening, and, if necessary, cutting with scissors any tendinous attachments which impede its freedom. Care should be observed during this maneuvre not to cut the cuff-like prolongation of peritoneum which forms the canal of Nuck, and which is usually dragged from the internal ring and makes its appearance as the ligament nears the uterus. If the ligament still comes out easily, its attachments can be carefully snipped with the scissors and the cuff rolled back.

7. Anchoring the ligament. This is done by Dr. Kellogg by means of silkworm-gut sutures which are passed from the skin surface, and which also serve to close the wound, although he also uses superficial catgut sutures for the latter purpose. I use one buried kangaroo tendon suture for fastening the ligament. Otherwise I follow the directions of Dr. Kellogg. The loop of ligament, which will be from two to four inches in length, is held up by the assistant while its proximal portion, as it emerges through the opening in the tendon, is made fast

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to this structure by the suture, which is passed first through aponeurosis, then the ligament so as to grasp about two-thirds of it, and then the aponeurosis on the opposite side, and left untied. An aneurism needle is now passed in and out through the aponeurosis at the inner aspect of the wound, and through these two openings the loop of ligament is drawn by means of a heavy silk thread (Fig. 2), turned backward upon itself, and made fast to the aponeurosis and ligament by passing the loose suture through both sections and tying (Fig. 3). The one strand of kangaroo tendon is thus made to pass through the ligament three times and fasten the bunch together to the apo-
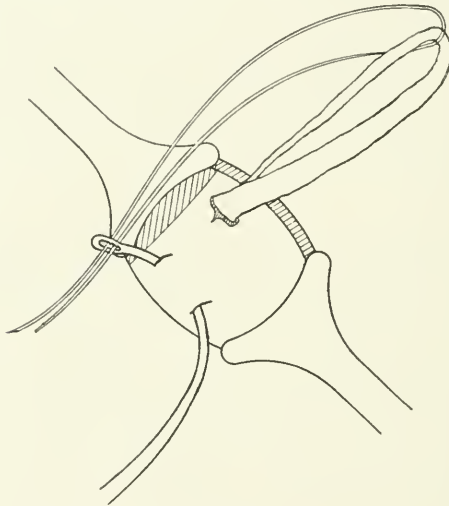
FIG. 2.

neurosis, in which position Nature will soon make permanent fixation.

8. Closure of the wound. This I do with fine catgut, using the buttonhole stitch, after which the wound is sealed with iodoform-collodion, reinforced with a layer of gauze which is saturated with the collodion, thus making a firm and impervious seal. Before using the collodion the surface of the skin where it is to be applied should be bathed with sulphuric ether, which removes any oily material and thus insures the firm adhesion of the seal.

A thick pad of gauze and a T-bandage complete the dressing. The seal is removed after the tenth day, and as it is stripped off, the catgut sutures, which by that time are absorbed beneath

the surface, come away with it. The time required by this method of operating is very much less than by the Alexander method. If anatomical points are carefully noted, the ligament will be seized at the first trial and the operation quickly completed. Delay usually results from inability to properly locate Poupart's ligament. Twenty minutes should usually suffice to complete both sides after the operator has become master of the technique, and in some cases it can be done in considerably less time if the operator is especially dexterous. The patient should be kept in bed for two weeks, which I think is sufficient time for the ligaments anchored in this way, by being woven in and out through the aponeurosis, to become firm. In the
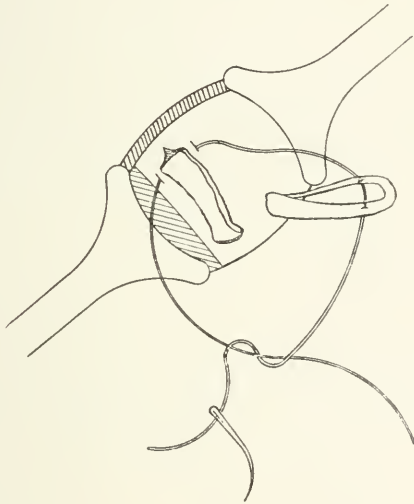
Fig. 3.

old method, where the ligament was cut off and sewed to the pillars of the external ring, the danger of the ligaments giving way is much greater and requires the patient to lie in bed for a much longer period. The danger of the operation proving a failure because of suppuration is less with this operation, as the long loop of ligament could hardly be drawn back through the aponeurosis, while a severed ligament held only by sutures would easily give way.

Previous to operation a suitable pessary should be fitted for holding the uterus in anteversion during the operation, and this should be left in position, with occasional inspection, for three months afterward.

E. C. Dudley, in his recent admirable work on " Diseases of Women," advocates this method of operating, modifying the technique only in the method of securing the ligament, which he accomplishes by passing the ligament back through the puncture in the aponeurosis, then bringing it out again at a point as far forward as possible, laying it back and making it fast to the aponeurosis with buried catgut sutures, after closing the first puncture in the aponeurosis.

My modifications of Dr. Kellogg's method are in the location of the skin incision by the relation of the femoral artery to the internal ring, suturing the ligament with a buried tendon suture, and closure of the wound with catgut and collodion.

I have thus far during the last eight months performed the operation on fifteen patients, which is perhaps too small a number and too short a time on which to base statistics, so these cases will not be reported at present. But the experience with them and the results up to date have convinced me that this operation has come to stay, as it has the points of merit designated in the title of this paper, being simple in design, effective in results, and esthetic because it is a work of art and beautiful to look upon.

698 WOODWARD AVENUE.

INTESTINAL ADHESIONS IN SUPPURATIVE PELVIC DISEASE : THEIR SIGNIFICANCE AFTER VAGINAL HYSTERO-SALPINGO-OÖPHORECTOMY;

WITH REPORT OF A CASE OF ILEUS.[1]

BY

F. BLUME, M.D.,

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THERE is perhaps no subject in the whole range of surgery which, within the past few years, has been so frequently discussed in societies and journals as the management of suppurative pelvic disease. Yet, in spite of all these discussions, the question how to deal with the various forms of pelvic suppura-

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

tion is far from being settled, and even the prospects of establishing more precise indications for the treatment of these conditions in the near future are by no means encouraging.

New methods of treatment, like new drugs or other innovations, if introduced by men of great reputation, seldom fail to arouse enthusiasm long before their value is really established. If they appear to be of great importance, the enthusiasm grows and soon spreads, contagion-like, irresistibly sweeping everything before it. Such was pre-eminently the case with vaginal hystero-salpingo-oöphorectomy after its recommendation by Péan for a certain class of cases of pelvic suppuration. Though vigorously attacked by the exponents of the suprapubic operation, it has well stood the test of time, and, if limited to those serious bilateral suppurative lesions which preclude conservative methods, it is looked upon to-day by many surgeons as a life-saving operation, a benefaction to womankind.

Any one who, without prejudice, studies the literature of this subject must admit that the advocates of the radical vaginal procedure have ably defended their position and that the weight of argument is overwhelmingly on their side. It cannot be denied, however, that some of the writers, carried away by their enthusiasm, have overdrawn the picture when they speak of rapid recovery, patient out of bed in a week or ten days, no complications and sequelæ, mortality practically *nil*.

On the other hand, one of the most perplexing things is the lack of argument in the attacks of the partisans of the abdominal operation. Painting in too glowing colors the picture so well known to all of us, they describe the abdominal route as the ideal method; recovery uneventful; patient, though able to be dismissed sooner, left the hospital in excellent condition at the end of three weeks; mortality slightly higher than after the vaginal operation, but no complications and sequelæ; ventral hernia unknown or rarely seen in their own cases.

Those who from personal experience are familiar with the advantages and disadvantages of both procedures cannot be misled by such enthusiastic writers. They must, however, deeply regret the one-sided manner in which this subject has been so frequently debated. The usual terms, pyosalpinx, suppurative pelvic disease, and the like, comprise a variety of lesions which differ essentially in their etiology, pathology, and symptomatology. From this point of view the various methods of treatment and their results must be studied. The history of the cases, whether acute or chronic, the condition of the patient, and the possibility of complications must also be taken

into account if just and satisfactory conclusions shall be reached. Simply to object to the vaginal operation because one believes that the removal of the uterus takes away the keystone of the pelvic arch, that it spoils the pleasurable sensation experienced during cohabitation, or because of some other equally unfounded and unimportant reason, does not help to throw light upon the subject. Such objections do not account for much in the face of the excellent results which have been and are daily obtained with this life-saving operation. They stand on a par with the reasoning of that class of vaginal enthusiasts who, restricting the abdominal route almost exclusively to large tumor cases, are ready to operate through the vagina for any morbid condition that may befall the pelvic organs. Lawson Tait,[1] criticising the assertion that after the removal of the uterus the sexual appetite is lost and the sexual relations are disturbed, well hits the mark when stating, in his characteristic manner, that he does not regard the " sexual-appetite argument " as worthy of any but the brothel-keeper. If the profession at large has not yet arrived at this conclusion, it is rapidly approximating thereto.

Though it is not intended to review the objections raised against vaginal hystero-salpingo-oöphorectomy, I cannot conclude my introductory remarks without briefly commenting on a remarkable paper recently published by Dr. J. M. Baldy.[2] This paper is of interest because its author attempts to establish a certain standard of death rate for the suprapubic operation and to thus abolish the vaginal procedure. Based upon a series of 73 cases of inflammatory pelvic lesions with one death, a brilliant result which any operator may justly feel proud of, Dr. Baldy arrives at the conclusion that a five per cent mortality should be considered the standard rate. All cases in the tables, as the doctor states, are arbitrarily divided into salpingitis and pyosalpinx, to indicate the absence or presence of pus. Analyzing them we find that 25 are recorded as double pyosalpinx, 2 as unilateral pyosalpinx, 1 as puerperal phlebitis and lymphangitis, and the remaining 45 as double salpingitis. Among the 25 patients with double pyosalpinx the one death occurred, a mortality rate of four per cent. As the indications for vaginal hystero-salpingo-oöphorectomy should be limited to serious cases of bilateral suppuration, it is this group of cases only which interests us here. It is evident at first sight that a

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[1] Buffalo Medical Journal, May, 1899, p. 731.
[2] AMERICAN JOURNAL OF OBSTETRICS, May, 1899.

series of 25 cases—or, adding the case of puerperal phlebitis, 26 cases—though it may show what a skilful surgeon can accomplish, is far too small to be of value in the decision of such an important and complicated question. The fact that, with few exceptions, the mortality of the abdominal operation for these grave lesions is still exceedingly high, varying between seventeen and twenty-five per cent, is verified by the records published in our journals.

In a paper which I had the honor to present to you at our Pittsburg meeting I reported the complications with which I had met in 3 cases in a series of 42 vaginal hystero-salpingo-oöphorectomies. In one instance only, the complications were unavoidable—a case of ileus due to intestinal adhesions antedating the operation. This pathological condition of the bowel complicating the pelvic lesions has led to objections to the vaginal operation. It is especially from this point of view that a distinguished Fellow of our Association, Dr. Joseph Price, has discussed the subject and advised against the vaginal route whenever the opportunity presented itself. Some of his remarks made in the discussion of my paper have been exceedingly interesting to me, especially the following sentence: "Given a case with vicious disease of the tubes and ovaries without complications above, or if I can dismiss complications of every character above the uterus and appendages, then I should say the vaginal operation is the operation above all others." These words, coming from an abdominal surgeon with an enormous experience, are worthy of earnest consideration. While the superficial reader, perhaps, may regard them as a condemnation of the vaginal procedure, to me it sounds quite well when one of the most successful abdominal surgeons declares that in serious bilateral lesions the vaginal operation is the operation above all others if suprapelvic complications can be dismissed.

I have always held the opinion that the value of an operation does not depend upon the immediate result alone. Any operative procedure which is not curative in the vast majority of the cases does not deserve recommendation, no matter how brilliant the immediate results may be. The very fact that the radical vaginal operation is curative, and that the serious post-operative sequelæ which often follow the abdominal procedure are absent, has led me to adopt the vaginal route. It is from this point of view that I discussed the complications which I had observed in my vaginal work for pelvic suppura-

tion in the paper read before you last year, of which this brief article is the continuation. From personal experience I am forced to admit that in some instances grave disturbances may result from the coexisting suprapelvic lesions, and that of all the objections the complication theory is the most important, deserving further investigation.

We all remember too well the complications with which we have met in our abdominal operations for suppurative pelvic disease. The pathological conditions in this group of cases are by no means always confined to the uterus, the appendages, the bladder, the rectum, and the sigmoid, where they possibly could be completely relieved by the vaginal operation. In many instances the inflammatory process extends to the abdominal cavity, involving a large part of the omentum and many inches of that portion of the small intestines overlying the diseased pelvic structures. Adhesions are found to have formed between various loops of intestines, between bowel and pelvic wall, between bowel and omentum, or omentum and bladder, as the case may be, according to the extent and severity of the inflammatory process. These intestinal and omental lesions, which cannot be dealt with by the vaginal route, are frequently observed in secondary abdominal sections. They are of common occurrence after the ablation of the appendages by the suprapubic operation, and in many instances accompanied by an inflammatory process about the pedicles resulting in the formation of exudates.

It is well known that general adhesions between the coils of small intestines do not interfere with the peristaltic action, and the advice of writers with great experience, not to break them up when operating suprapubically, deserves commendation. They are no more an obstacle to the vaginal route than those which bind bowel and omentum to the diseased pelvic organs and which are easily separated. The formation of peritoneal bands, however, or of adhesions between the ileum and the pelvic floor, it must be admitted, cannot be regarded as harmless complications. The statement that under these circumstances the descent of the bowels following the vaginal extirpation of the uterus and appendages favors intestinal obstruction, is as true as the assertion that this grave complication is of the rarest occurrence. While I have met with 2 cases of mechanical ileus in 51 vaginal hystero-salpingo-oöphorectomies, other operators, reporting large series of 100 and 200 cases, have never, or but rarely, seen this complication. Upon

inquiry I learn that of our Pittsburg gynecologists I am the only one who observed ileus following the vaginal operation for this *class of disease.* The records published within the past few years, representing many hundred cases, demonstrate beyond dispute that we need not fear the suprapelvic lesions. From the evidence which they present we are justified in saying that the vaginal operation is the operation above all others in those grave cases of pelvic suppuration in which both appendages must be removed.

My first case of intestinal obstruction occurred in a series of 42 vaginal hysterectomies and was reported last year. Since then I have done 9 vaginal hystero-salpingo-oöphorectomies for pelvic suppuration and have had another case of ileus, the history of which I now submit to your kind consideration.

Mrs. E. M., age 21, married; menstruation at 11, normal; one child, 9 months old; labor and puerperium normal. Patient was in good health until about two months ago, when she was suddenly seized with severe cramp-like pains in the lower part of the abdomen, followed by fever lasting four weeks. Uterus large, retroverted, adherent, and surrounded by hard masses of a bony consistence which filled the pelvis posteriorly and on both sides. Bacteriological examination showed streptococci. Gonococci could not be found. Pelvic peritonitis due to streptococcus infection. The cause of the infection could not be determined. It looked like a case of abortion, but the patient positively denied having been pregnant.

Vaginal hystero-salpingo-oöphorectomy May 31, 1899. The operation was difficult, the uterus being immovable and so friable that the forceps tore out at the least effort at traction. Scattered throughout the indurated tissue were numerous small pus cavities. Both tubes were large, but contained only a few drachms of pus. Their walls were friable and of enormous size, especially at the fimbriated extremities. The amount of pus removed was small, scarcely more than one ounce. Bacteriological examination showed the streptococcus pyogenes.

The patient reacted well under the free use of stimulants and made a good recovery. From June 4 she improved rapidly. Her temperature was normal; the pulse remained accelerated until June 12, varying between 90 and 100. On June 14, the fifteenth day after the operation, she complained of severe abdominal pain, and from this day on the symptoms of intestinal obstruction gradually developed. The pulse rate increased to

100. Nausea and vomiting. The abdomen became tympanitic; increased peristalsis was visible through the thin abdominal walls. The bowels, which daily had promptly responded to mild cathartics, became more and more constipated, until, after June 17, all attempts to obtain a movement resulted in failure. Thirty-six hours later, the twentieth day after the operation, I opened the abdomen. The general condition of the patient was still good; pulse 120, temperature 98°, skin slightly cyanotic.

Celiotomy June 19, 1899. Omentum adherent to abdominal wall was separated. At once two distended coils of the ileum appeared in the abdominal incision, one of them being rotated more than half-way about its longitudinal axis—partial volvulus—and kept in this position by several firm bands. As soon as these bands were cut between ligatures the collapsed portion of the bowel below the constriction became distended. The omentum which was adherent to the bladder and underlying bowel was next released, ligated, and a large portion of it excised. It could now be seen that numerous coils of the ileum were involved, being adherent among themselves and to the pelvic floor. After all the adhesions were broken up the loops of the intestines were drawn out, stitched at different points, and replaced. Abdomen closed.

The patient left the table with a pulse of 140, received a pint of normal salt solution under each breast, and rallied quickly. She made a most excellent recovery. Gas expelled by rectum fifteen hours post operationem; bowels moved on third day. Abdominal sutures removed on the fourteenth day; primary union. Patient discharged in excellent condition July 11, the twenty-third day after the second operation.

The question suggests itself: Was the radical vaginal operation indicated in this case? Palliative treatment was faithfully tried for over a month after the acute attack had subsided. It utterly failed to improve the patient. Vaginal incision and drainage was seriously considered, not as a curative, but as a temporary operation. This simple procedure, so valuable in large accumulations of pus, is especially indicated in acute suppurative conditions if the presence of purulent collections can be made out. Any attempt, however, to drain such thick and indurated tissue with its multiple centres of suppuration, as in the case under discussion, not to speak of the tubes with walls more than half an inch in thickness and but a small amount of pus, must result in failure. I know from personal experience that this condition, so characteristic of streptococcus

infection, cannot be even temporarily relieved by vaginal incision, and that other operators have come to the same conclusion.

Abdominal section was out of the question in this acute case of streptococcus infection, the danger of sepsis being too great. The contamination of the peritoneal cavity by virulent streptococci, so difficult to avoid in the abdominal operation, is quickly followed by peritonitis, and in many instances by death. Therefore it is a wise plan to attempt to relieve these patients by palliative treatment and to postpone the radical operation until the bacteria have lost their virulence. If palliative means fail, or are deemed inefficient as in this case, if the social condition of the patient will not permit her to remain in bed an invalid for half a year or longer until the bacteria have ceased to live, then vaginal hysterectomy should be the operation of election as the least dangerous procedure.

The time has passed when a surgeon could say, without jeopardizing his reputation, that he operates exclusively by the abdominal or the vaginal route. Since the introduction of vaginal hysterectomy and the revival of vaginal incision and drainage, our views regarding the treatment of suppurative pelvic diseases have undergone remarkable modifications. We have learned to appreciate the value of the differential diagnosis between the various forms and stages of the disease. We realize that there is no longer but one method of surgical treatment, and that, in order to do justice to the patient, we must select that method best adapted to the case.

I have seen many women who, after abdominal section for pelvic suppuration performed in this country and abroad, were invalids, and I have done secondary operations upon a number of them. But neither have I been called upon to treat a woman upon whom vaginal hysterectomy was performed by another surgeon, nor have, to my knowledge, any of my patients required or sought treatment at the hands of other operators. My experience is in accordance with the observations of other writers, and justifies the assertion that the results of vaginal hystero-salpingo-oöphorectomy in suppurative pelvic disease are excellent, notwithstanding the suprapelvic complications, and that there is no class of cases which, as a whole, gives more satisfaction.

524 Penn avenue.

WHAT SHALL WE DO WITH THE POST-OPERATIVE HEMORRHAGE OF CELIOTOMY? [1]

BY

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" IF the patient, having rallied from her ether, with a good pulse and practically normal temperature, be found in the course of the next twenty-four hours to be showing the indications of collapse, together with a rising pulse and falling temperature, hemorrhage will almost always be found to be at the bottom of the trouble. The pulse under these circumstances becomes feeble and is rapid and running in character. The temperature and pulse, together with the general condition of lassitude and growing indifference, are almost pathognomonic of the condition. If the bleeding be allowed to continue these symptoms gradually deepen, and the more advanced indications of collapse, such as great pallor, sighing, and cold surface, supervene. . . . The symptoms of shock may readily be mistaken for hemorrhage, the difference being that in hemorrhage the indications do not begin for some hours after operation, while in shock they are present from the first. Otherwise, the two present so many points of likeness that it is at times difficult to say which is present."

The above, taken from one of our leading text books, is a very fair exposé of the prevailing knowledge regarding the symptomatology of internal or concealed hemorrhage. I believe it to be practically correct. Still I must say that there are few questions connected with gynecic surgery that have given me more concern and upon which I have been more at sea than the one under consideration. Could we always be sure of our diagnosis, matters would be much simplified; but even this would not solve it, for we have to deal with other factors, such as the source and amount of hemorrhage and our ability to control it by other than surgical measures.

To make a long story short, I will say that my experience with the post-operative hemorrhage of celiotomy and conditions

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

simulating the same has not been of a character to confirm me in my earlier and more radical views as to treatment. Time was when I could have answered this question with alacrity, when I should have smiled pityingly on the man that hesitated. My motto was: "Open up and secure the bleeding vessels." I believed that all the dictates of reason and conscience demanded it, that surgical instinct demanded it. I believed then, as many believe now, that surgical instinct was the synonym for bold, active interference. Thanks to the tempering influence of age and experience, I have attained a higher conception of the term and its significance. As I stood by the bedside of the patient in whom I suspected internal hemorrhage, surgical instinct whispered: "Open up and seek for the bleeding vessel." When, some hours later, I looked upon the lifeless form of this self-same patient and witnessed the outcome of my uncalled-for interference, I began to question the identity of my monitor. A little later and I stood at the bedside of an apoplectic, and I asked myself why surgical instinct did not prompt me to lift the calvarium and go after the bleeding vessel. Then it dawned upon me that surgical instinct no more implied active surgical interference than practical medicine implies active purgation. True surgical instinct conserves the best interests of the patient.

As has been said, the diagnosis, the prognosis, the natural tendency, and the amenability to treatment all play a rôle in the management of these cases. That the diagnosis is sometimes beset with difficulties insurmountable is the testimony of all experienced observers. The subnormal temperature, which, in connection with the rapid pulse, blanched surface, and great prostration, is depended upon as being specially significant of hemorrhage, may, and sometimes does, depend on something else. It is a physiological fact that the vessels of the portal system alone, when distended, are capable of containing all, or nearly all, the blood of the body; that when so distended they form a reservoir into which may be drained the blood of the brain, the vital centres, and of the heart itself. It is well known that patients sometimes perish from the accumulation of blood in the enormously distended vessels of this region. It is known, furthermore, that certain vasomotor disturbances are responsible for this condition. When such is the case the temperature falls, the pulse runs riot, and all the indications point to an internal hemorrhage; and while there has not been the loss of one drop of the vital fluid, this diversion

serves to kill as quickly and effectually as though a trunk vessel had been severed. These are the cases of which authors speak as bleeding to death in their own veins. There are other conditions that influence the temperature, the exact nature of which we cannot determine, but which nevertheless produce a symptomatology so essentially like that of internal hemorrhage as to be indistinguishable from it. Some of these conditions are illustrated in the following cases.

The first was a case of bleeding fibroid for which I did hysterectomy. The patient was greatly exsanguinated, nervous, and depressed. The operation was without incident, and before closing her up it was noticed that the pelvis was exceptionally dry. This was the first of a series of four abdominal operations for that morning, and owing to the very favorable trend of affairs, and the excellent condition of the patient when lifted from the table, one of the assistants remarked that he believed the patient could walk down town. Four hours later I was summoned to the hospital and found the patient in collapse with the characteristic symptoms of internal hemorrhage. Examination revealed about four ounces of blood in the vagina. She was lifted on the table, and with an aneurism needle two stout ligatures were introduced, one on either side of the cervix, and firmly tied. Fearing, however, that internal hemorrhage might be going on, I made hasty preparation and opened the abdomen. I found about two ounces of blood in the pelvis, every ligature in place, and not a sign of hemorrhage. She was closed up and returned to bed. but, despite all efforts, sank and expired four hours later from shock. It may be contended that the loss of six ounces of blood was sufficient to bring about the fatal issue in this delicate and bloodless woman, but I do not believe it, for she had been habitually losing much more at short intervals, with little appreciable effect except to keep her pale and weak.

But, lest there should be some misgivings on this score, I will cite another case, about which there can be no question. This was a delicate and neurotic woman on whom I had performed hysterectomy for a troublesome fibroid of small size. The patient left the table in good condition. A few hours later I was summoned to the hospital and found her collapsed. She had every indication of internal hemorrhage. I pursued the same tactics as in the preceding case: first tying the vessels on either side of the cervix, and then opening the abdomen. There was no blood in the vagina and none in the abdomen; neverthe-

less she gradually sank, and expired within twenty-four hours, never having rallied from the shock.

Some time after this, and while the painful remembrance of these cases still haunted me, I had an experience after ovariotomy that in many of its features tallied closely with the last-described case. I contented myself in this case in using such restoratives as are usually resorted to in shock, such as strychnia hypodermatically, hot applications to the surface, elevation of the foot of the bed, stimulating rectal injections, and hypodermoclysis of the normal salt solution, all of which had been used in the preceding cases; and to my great relief, after several hours of anxious effort, I had the satisfaction of seeing my patient well out of danger. I firmly believe that both of my first patients would have rallied and probably survived the operation had I not opened the peritoneal cavity. I could add to this list two other cases with a fatal issue in which internal hemorrhage was strongly suspected, but in one of which a postmortem by myself revealed a clean abdomen, and in the other, according to the statement of the embalmer, there was no evidence of hemorrhage. I could also adduce several additional instances in which, profound shock coming on several hours after operation and characterized by rapid pulse and subnormal temperature, the patients rallied and recovered.

As will be seen from the above, the presently received indications of internal hemorrhage are not infallible, and, if implicitly relied on, may lead to grave mistakes, as in two of the cases cited above. I do not deny the great value of these diagnostic criteria, nor that as a rule they may be relied on, but the numerous exceptions, taken in conjunction with other features yet to be developed, should make us chary of precipitate surgical interference.

The prognosis of internal hemorrhage is another factor that should claim our attention. In the earlier days of my abdominal work, when the drainage tube constituted a necessary and frequently utilized part of my armamentarium, I had numerous instances of quite free internal hemorrhage, but which recovered without surgical intervention. One case in particular gave me great concern, and I was several times on the point of radical interference, but, happily for the patient and myself, refrained. The patient was a single lady about 30 years of age, the sister of an army officer. I had removed the appendages. Soon after the operation blood began to appear in the tube in inordinate quantities, so that, at intervals of half an hour to an

hour, from one to three ounces of blood were withdrawn. This continued several days, and the patient's pulse mounted to 135 accompanied with marked prostration. At this juncture, and as a last resort before the use of the knife, I gave ergotol hypodermatically and the hemorrhage ceased. But the most notable case of internal hemorrhage succeeding operation, with ocular proof and spontaneous cessation, that has ever come under my observation, was that of a minister's wife upon whom double ovariotomy had been performed by a colleague assisted by myself. The operation was done in the morning, and at 2 o'clock the following morning I was called for by the doctor, saying that his patient was bleeding. Arrived at the house, I found that the blood had forced itself through the incision and had saturated the dressings and bedding. She was lying in a pool of blood. My colleague gave the anesthetic, and, by the dim light of a smoking lamp held by the reverend husband, I proceeded to open her up. I found a large quantity of blood in the cavity. The patient was at no time fully under the anesthetic, and for the most part very much alive, and when the husband observed me bailing out the abdomen with my hands, he exclaimed: "She cannot live; she will surely die." To which she responded: "Oh, no, George; I will not die." Later, as I was bringing up the stumps to examine the ligatures, she complained bitterly of pain in the hypochondrium corresponding to the pedicle being handled. I mention this as an illustration of reflected pain. Examination of the ligatures showed them to be intact and not a drop of blood escaping from the pedicles. I was not able to determine the source of hemorrhage, and, after completing the toilet of the peritoneum as best I could with the means at hand, I closed her up. Several days subsequently she died of peritonitis without a recurrence of hemorrhage. Thus it will be seen that, with ocular proof of profuse internal hemorrhage, the prognosis is not always bad, even where the case is left to Nature.

Aside from the diagnosis and prognosis, which, as has been seen, are often obscure and sometimes misleading, there are other considerations which should cause us to hesitate before resorting to surgical intervention in cases of suspected hemorrhage following celiotomy. I refer to the inherently dangerous character of the intervention. If one were to look up the statistics on this subject, I feel assured that the death rate would be found appallingly high—that it would far exceed that of the recoveries. Now, this occurs not only in the practice of the

untrained, but in the hands of the most careful and expert among us; hence I say that the work is inherently dangerous. If it were only a question of making section in suspected intraperitoneal hemorrhage, I should not hesitate long; or even if it involved the reopening of the wound immediately or soon after its closure, I should not greatly fear the issue; but when it comes to the reopening of a wound that has been closed for several hours, I confess to an unconquerable aversion. It is not because we cannot be as clean, as careful, as in the primary operation; it is because of an essential difference in the attendant danger. Why this is I have not been able to make out, but suspect that it depends largely on the fact that the vital energies have been pretty well exhausted at the primary operation. It would seem that following the primary operation, especially after the lapse of a few hours, all the reparative machinery of the economy has been put in operation; that there is a marshalling and massing of all the vital forces for a supreme effort. If you go in there now you carry confusion into the ranks of your allies and cripple the resources of the economy to a most dangerous degree. Doubtless the time at which such secondary operations are performed has much to do with the result. Owing to the obscure symptomatology there is little or nothing to indicate the presence of internal hemorrhage until evidences of shock are so pronounced as to force themselves on the attention of the nurse. In the majority of instances the surgeon, who has done his morning's work, is far away busily engaged in the daily routine which follows his hospital duties. By the time he is found and arrives at the bedside of the patient the shock has deepened into collapse and the patient is *in extremis*. He takes desperate chances for a desperate condition, and as a rule the patient succumbs.

In conclusion, I have little to offer in the way of suggestion. As a burnt child dreads the fire, so my most painful experience in the tragic cases cited above has imbued me with a wholesome dread of delayed interference after celiotomy.

This, of course, refers to intraperitoneal interference, for I have on several occasions opened up the abdominal incision down to the peritoneum for hemorrhage from the walls, without untoward result. This latter class of cases can usually be easily distinguished from intraperitoneal bleeding by the puffed and discolored appearance of the tissues along the line of incision. If I were satisfied that a large vessel had let go, as indicated by the rapid development of symptoms indicative of

hemorrhage, I should go into that abdomen with the utmost celerity. But this paper was not inspired by any hope or expectation of being able to suggest any line of action, my sole object being to elicit an expression of the prevailing views of my Fellows. Still, I would like to make one suggestion with reference to the medical treatment of such cases, and that is in the use of atropine. Some time since I had in charge a young lady who was subject to the most violent and persistent uterine hemorrhage of unaccountable origin. She had passed through many hands before coming to me, and I had tried many of the vaunted remedies without avail (as she could not make up her mind to curettage), when in one of her spells she fell into the hands of my brother, Dr. Charles F. Gilliam. He placed her on atropine, with the result that, after the physiological effects of the atropine became manifest, the bleeding ceased. Since then her attacks have been less frequent and always promptly amenable to the atropine treatment. Other cases followed in his and my practice, among which were some intractable cases that had been curetted, and in every instance so far the hemorrhage has been controlled by the atropine. I am nothing of a therapeutist, and in fact am something of a therapeutic nihilist, but the results have been so convincing in the cases that have fallen under my observation as to force conviction. As to the *modus operandi* I can only speculate. We know that atropine increases the cutaneous circulation, producing a general and marked hyperemia of the surface; we know that the cutaneous vessels are capable of containing nearly one-half of the blood of the body, hence by derivation it diminishes the amount of blood circulating in the internal organs. It is not altogether improbable, indeed I think it quite likely, that the vasomotor action that dilates the cutaneous vessels, coincidently and by way of equation constringes the visceral vessels. The duodenal ulcers resulting from extensive burns of the skin would argue in favor of compensatory vascularity. It is not expected that this or any other medicinal agent will arrest the torrential hemorrhage of the larger vessels, such as the uterine or ovarian arteries, but is especially applicable to that troublesome form of hemorrhage which emanates from numerous vessels of smaller calibre. As to the vital question, when we shall interfere surgically and when refrain, this paper ends where it began—in an interrogation point.

70 WINNER AVENUE.

THREE RARE CASES OF KIDNEY CYSTS.[1]

BY

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CASE I *Enormous Hydronephrosis simulating Ovarian Cystoma.*—Mrs. M. A. H., Columbus, O., referred to me by Dr. S. O. Giffin, October 17, 1898; age 56 years; married for twenty years; a widow for the last fourteen years; mother of two children, the youngest 24 years of age; labors normal; no abortions; general appearance good; bowels regular; appetite poor; has had some irritation of the bladder at times; passed the menopause normally at 48 For the last two years had noticed that she was getting somewhat larger, but supposed that it was ordinary stoutness incident to her age. A month ago had a fall down the cellar stairs. Since that time has had some pain in the right side of the abdomen and has noticed a somewhat rapid increase in size. This led her to consult her physician, who found a tumor present. This tumor is so large that the patient presents the appearance in general of a woman pregnant eight months. The tumor is not entirely symmetrical in character, being decidedly more prominent on the left side of the median line. It extends down into the pelvis, pushing the uterus to the left. The patient does not know of any starting point of this tumor, but only knew of its existence when her physician found it on her visit to him yesterday. Fluctuation is distinct throughout the entire mass, and the diagnosis of an ovarian cystoma seems perfectly plain.

The patient was operated upon at her residence October 19, Dr. Giffin administering the anesthetic and Drs. Chapman and Lyne assisting. The usual abdominal incision was made a little to the right of the median line, just large enough to admit a couple of fingers, with the expectation of tapping the cyst and drawing it out through the small opening. The introduction of the fingers showed that the tumor, while dipping down into the pelvis, had no pelvic connections and was entirely retroperitoneal. The incision was therefore enlarged until the hand could be introduced, when it was found that the

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

mass, though apparently much larger on the left side of the abdomen, originated on the right side. The tumor was tapped with a large trocar and about ten pints of fluid drawn off. The fluid evidently contained some recently effused blood. The sac being now collapsed, the opening in the visceral peritoneum was enlarged, the hand introduced, and the sac enucleated. It was found attached throughout to the connective tissue of the ascending meso-colon, the head of the colon and the ascending colon being, indeed, under the line of the original incision. The tumor extended up under the liver and was enucleated with considerable difficulty from this region. When enucleation had progressed about one-third of the way down, a very small blood vessel was encountered, which, when torn across, spurted. It was very small and was ligated with fine catgut. This was the only vessel needing any ligature. As the enucleation progressed a pedicle was finally reached extending down to the bottom of the pelvis. This pedicle, when brought up, was found to resemble very closely a piece of small intestine. Tracing this down, it was found to enter the pelvis behind the head of the colon and the last portion of the ileum. More careful study showed that the cyst itself was simply an enormous hydronephrosis, and that the pedicle, resembling a piece of small intestine, was the dilated ureter. The tumor was therefore removed, the pedicle being caught with forceps; a buttonhole was torn through the peritoneum deep down in the pelvis, and the ureter drawn through this opening and separated to the base of the bladder. Just at this moment the patient made a sudden movement, so that it was torn off just above its point of entering the bladder. An opening was made through Douglas' cul-de-sac, this remaining bit of ureter caught with forceps and drawn into the vagina with a wisp of gauze to hold it in place. The space left after the removal of the cyst had collapsed, and there was no hemorrhage whatever. The peritoneal opening through which the hand had been passed fell naturally together and was left unsutured, so that if any hemorrhage occurred it would find an exit into the general peritoneal cavity. Before closing the abdomen the region of the right kidney was explored and no vestige of any organ found. The left kidney was *in situ*. The abdomen was closed without drainage. The patient made an uninterrupted and rapid recovery. More careful examination of the sac removed showed that it contained no vestige whatever of kidney structure or of blood vessels. It is evident that we had here a very old hydronephrosis; that as a

result of the fall there was a hemorrhage into the sac, accounting for the pain which she felt and the rapid increase in size. Subsequent close interrogation failed to elicit any history of kidney trouble.

A more careful study of the case in the light of post-operative knowledge has not enabled me to see how any other diagnosis than the original one of ovarian cystoma could have been arrived at.

CASE II. *Large Paranephric Cyst.*—Mrs. S. C., referred to me by Dr. Kirkpatrick, of London, O., December 13, 1898; age 33; married five years; never pregnant; general appearance fair; appetite poor; bowels constipated; some irritation of bladder at intervals; menstruation fairly normal. Was sick with something resembling a local peritonitis of the right side last June. Has never been quite free from some local soreness in this region since that time. Was examined by her physician this morning, who found an enlargement on the right side and sent her to me. Examination at this time shows a cystic tumor in the region of the right kidney, about the size of a fetal head. It is somewhat tender on pressure, especially at its lower pole. It is in this region, she says, that she has had the tenderness during the last six months. A diagnosis of hydronephrosis seems natural, although from the family history of the patient tuberculosis cannot be overlooked. Operation was advised, and was made December 15 at the Protestant Hospital, Dr. Chapman assisting and Dr. Kirkpatrick being present. As a preliminary, Harris' instrument for securing the urine from each kidney was introduced. During the few minutes of its remaining *in situ*, and while about a drachm of urine came from the left kidney, only a drop or two appeared from the right. This seemed to confirm the idea of a diseased condition of the right organ.

An incision was made in the loin as usual. As the knife was being used to enlarge the opening slightly downward into the deeper parts, a cyst was incised, which gave exit to a fluid resembling urine in every way. The cyst wall was seized with forceps and the entire cyst enucleated, though not without some difficulty. It had no pedicle and no special vascular supply. The cyst being removed, it was found that the previously existing mass had entirely disappeared. By bimanual examination, with the fingers of the left hand introduced into the incision, the contour of the right kidney could be easily made out. This kidney was seemingly normal in size and structure. The cyst removed had an exceedingly thin wall,

scarcely thicker than the lining of an eggshell. The contents, which had escaped, were estimated to have amounted to about a pint and a half. The incision was closed except a space for a wisp of gauze, which was allowed to remain for a few hours, its removal being followed by union of the wound by first intention. Examination of the patient some months later satisfied me that the inflammatory trouble which she had had, and the attacks which followed, were all the result of appendicitis, from the chronic form of which she still suffers, and for the relief of which an operation has been advised and will probably be made.

The cyst was clearly, I think, what is known as a paranephric cyst. I have been able to find very little literature on this subject, but Henry Morris gives a fairly satisfactory description in his little work on the "Surgical Diseases of the Kidney." He says they are neither developed in the kidney nor are they due to a dilatation of the renal pelvis. Although they sometimes have a connection with the interior of the kidney, this connection is supposed to be secondary in the development and to be really a fistulous passage. He reports one case which was found at autopsy during the records of ten years at the Middlesex Hospital. Patient died of carcinoma of the small intestine, obstructing the ureter and producing dilatation of the pelvis of the kidney. Behind this kidney there was a large cavity containing clear fluid; the anterior wall of this cavity being formed by the kidney capsule, the posterior and lateral walls consisting of condensed paranephric cellular tissue. A small passage extended from the cyst to the dilated renal pelvis. While little seems to be known about these cysts, it is not difficult to regard them as due to the presence, outside of the kidney and unconnected with the ureter, of a minute mass of congenitally misplaced kidney tissue. The slight secretion of urine would result in the formation of the cyst, which, becoming greatly distended, would cause obliteration of the kidney tissue, or at least its change beyond macroscopic recognition.

CASE III. *Cyst of a Retrorectal Congenitally Misplaced and Sarcomatous Kidney.*—Mrs. F. D. M., referred to me January 2, 1899, by her physician, Dr. A. H. Kreager, of Nashport, O. Patient aged 60 years; mother of five children, the youngest 18 years of age; labors normal; no abortions; general appearance fair; appetite poor; bowels opened with extreme difficulty, owing to the presence of a tumor; urine normal, but urination impossible except with catheter, owing to

the tumor. First noticed that something was wrong in her pelvis about the last of October. At that time, while lifting a basket of peaches, felt something give way in her pelvis. She can tell very little about its rapidity of growth. Has lost a good deal of flesh, especially during the last two weeks. Her legs pain her some, but they are not swollen. On examination find a large, smooth mass filling Douglas' cul-de-sac, pushing the womb up out of reach and pressing firmly against the pubes, so much so as to obstruct the passage of urine, though the finger can be forced between the tumor and the symphysis. Rectal examination seems to show the rectum passing back of the tumor and flattened out by it. The tumor is immovable, but clearly cystic. Diagnosis is that of an ovarian cystoma incarcerated in the pelvis. Operation was made January 4, 1899, at the Protestant Hospital, Dr. Chapman assisting, Dr. Kreager being present. An attempt was made to open the cyst through the vagina. It was found, however, that the rectum, which at its lower end seemed to pass up behind the tumor, really made here a mere pouch, and above was spread out in front of the cyst. Working to one side with the fingers, the rectum was pulled over out of the way, but on trying to sepa-rate the adhesions somewhat more extensively, the finger entered the lumen of the bowel. The abdomen was then opened, when it was found that the tumor was a cyst filling the pelvis poste-riorly and located behind the rectum and pelvic peritoneum. Uterus and ovaries were normal. The tissues over the tumor were exceedingly vascular, so much so that it seemed wise to again attempt its removal per vaginam. The cyst was accord-ingly tapped through the opening which had already been made, and over a quart of straw-colored fluid, resembling urine, was drawn off. The tumor being collapsed, its wall was seized and enucleation attempted, but the adhesions were too firm be-yond the reach of the fingers. Entrance was therefore again made through the abdomen, the peritoneum incised, and the upper portion of the tumor enucleated. The firmest adhesions were in the region of the sacrum, and all the adhesions were very vascular, so that the hemorrhage was quite profuse. The tumor, being entirely enucleated, was removed through the abdomen, Hemorrhage was controlled by packing with gauze sponges, and finally by a mass of gauze packed firmly into the cavity, the end being passed out through the opening into the vagina. The peritoneum was then carefully closed over this gauze with catgut, the pelvic cavity cleansed, and the abdomen closed in the usual way. The patient's recovery was uneventful, though

somewhat tedious owing to the drainage inserted in the post-
rectal cavity. The opening into the rectum was small and
made no trouble. Under date of September 15, Dr. Kreager
writes me that the patient is still in excellent health, has in-
creased somewhat in weight, and is able to do the housework
for a family of seven. She has no trouble with her kidney so
far as she knows, but passes about one quart of urine per diem.

Examination of the specimen removed showed it to be a sar-
comatous kidney with hydronephrosis as a complication.
While the sarcoma seemed to have destroyed all the kidney
structure, so that the microscopic examination was somewhat in
doubt, examination of the patient before her return home, by
means of the Harris instrument, showed no secretion whatever
from the left kidney, while a normal amount was coming from
the right.

Several years ago I saw a male patient, in consultation with
Dr. Adams, of this city, who had a tumor filling the left side
of the pelvis, closely resembling in its physical characteristics
an ordinary multilocular ovarian cyst. The left testicle in this
patient had never descended, and the diagnosis of sarcoma of an
undescended testicle seemed to be very clear. The growth finally
extended well up into the abdomen. The autopsy showed a
normal testicle embedded in a mass of sarcoma which had orig-
inated in and entirely destroyed the left kidney. In this case
we had evidently, I think, a pelvic kidney which had become
sarcomatous, as in the case which I have just recorded.

A brief synopsis of this case was sent to Mr. Tait, of Bir-
mingham, and to Drs. Kelly and Price, of our own country.
All of them replied promptly to the letter of inquiry, stating
that they had never seen or heard of such a case. Mr. Tait re-
plied at considerable length, enclosing a diagram showing how
it might have occurred from a misplacement of a portion of the
kidney congenitally malformed. He evidently misunderstood
the report and thought that the pelvic kidney tissue was in
addition to that in the normal position.

These cases are submitted because of their rarity. Quite a
number of cases have been reported in which hydronephrosis
has been mistaken for ovarian cyst. Paranephric cysts seem
to be much more rare. The third case which I have reported
is, so far as I can learn, entirely unique.

112 NORTH FOURTH STREET.

RETROPERITONEAL TUMORS,

WITH REPORT OF A CASE AND PRESENTATION OF SPECIMEN.[1]

BY

RUFUS B. HALL, A.M., M.D.,
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(With an illustration.)

THE etiology, pathology, and diagnosis of retroperitoneal tumors were so thoroughly discussed two years ago by one of the Fellows of this Association before the Southern Surgical and Gynecological Association at their meeting in St. Louis, that nothing need be said concerning these portions of the subject. To avoid repetition I shall omit all reference to them and present a case report with a specimen.

Retroperitoneal tumors that are operable are rare. My experience in dealing with them, so far as removal of the tumor is concerned, has been limited All retroperitoneal tumors are difficult to remove, and the operation is attended with a high mortality. They are often malignant. The specimen presented to-day is probably a fibroid tumor of the uterus. When the tumor was removed eighteen months ago it was so soft and so unlike a fibroid tumor in appearance and consistence that I doubted this very much. The attachment to the uterus was so indistinct that one would doubt that it had its origin from that organ. You will observe from the specimen that the tumor was wholly post-peritoneal. It occupied the patient's right side, almost wholly filled the pelvic cavity, and projected well into the abdomen.

Mrs. B., age 38, consulted me February 14, 1898. She was well nourished and always enjoyed good health until eight months before her visit to me, when she first noticed a small tumor in the right iliac region, not larger than a small orange. The patient, being a very intelligent woman, gave a clear and precise clinical history up to the time of her visit, which was corroborated by her family physician, Dr. Rowe, of Cincinnati. She had been married seventeen years and was the mother of two children, the younger 13 years old. She had never had a

miscarriage or ever been treated for any pelvic or uterine disease previous to the present illness. She did not suffer much inconvenience other than " a heavy, dragging feeling " in the pelvis and abdomen.

Upon physical examination we found a tumor that had the appearance of a semi-solid mass, nearly as large as an adult head, occupying the right side of the abdomen and extending well down into the pelvic cavity. The uterus, which was not enlarged, was retroverted, and the cervix presented at the vulva. The patient complained of frequent micturition, which

was without pain. From physical examination one was inclined to believe that the tumor was solid, probably a fibroid tumor of the uterus fixed by adhesions; yet the clinical history of rapid growth did not coincide with this conclusion. The possibility of an intraligamentous ovarian tumor was discussed, but could not be certainly determined. The patient was apprised of the fact that the operation for the removal of the tumor would probably mean a hysterectomy. If, on opening the abdomen, the tumor proved to be an intraligamentous cyst, a hysterectomy might be avoided.

She entered my private hospital on March 7, 1898. The operation was made on March 10, and the tumor here presented removed. Upon opening the abdomen I was quite surprised to find this large tumor entirely post-peritoneal. Near the centre of the tumor was the head of the colon, and the mesentery pulled up over the side of the tumor corresponded with the middle line of the patient's body. The veins and arteries over this surface were greatly enlarged, and to make an attempt to remove it looked like a hazardous surgical procedure, yet to leave it promised nothing. By taking hold of the tumor mass with the two hands it was slightly movable, suggesting that it might be detached without great difficulty. The dilated ureter could be seen over the top of the tumor to the right of the median line of the tumor. The peritoneum could be picked up between the fingers over the top of the tumor. I regarded the tumor at that time as a fibroid tumor of the uterus developing from the uterine body near the junction of the cervix with the body, and at once decided to make a hysterectomy with removal of the tumor. The operation was made in the following manner: I first ligated the ovarian artery on the patient's right and divided the vessel between two ligatures. I then ligated the ovarian artery on the opposite side, divided it between two ligatures, cut through the broad ligament on that side, and divided the peritoneum above the top of the bladder over to the tumor and pushed the bladder down. I then ligated the uterine artery on the patient's left side, cut across the cervix, and clamped the uterine artery on the patient's right. I then divided the peritoneum behind the tumor up to a point on the tumor connecting with the incision made in front of the uterus. I then enucleated the tumor from below upward without much difficulty and with little loss of blood. There was general oozing from the large raw surface, and this induced me to make total extirpation of the cervix and drain through the vagina. My greatest anxiety during the operation was to avoid injuring the ureter. There was no injury to this important structure. The patient made an uninterrupted recovery, leaving the hospital inside of five weeks, and remains in good health at this time.

I have had microscopic slides prepared from a section of this tumor, and have placed them under the microscope here where the Fellows may see them. There is a difference of opinion among the experts as to the nature of this growth. Some say that it is a spindle-celled sarcoma, and others that it is not ma-

lignant at all. At the time of its removal I felt reasonably certain that it was malignant. The clinical history favors this opinion, yet the appearance of the tumor now is that of a fibroid of the uterus. It is too early yet to say definitely from the clinical history of the patient whether it is malignant or not. I know of one patient who was operated upon by a friend of mine for a sarcoma of the left ovary. She made a perfect recovery, lived ten years, and I made a second operation a year or more ago and removed the opposite ovary for a perfectly smooth, round, pearly-white, hard tumor that proved to be sarcoma. The patient recovered and is now enjoying good health.

The record of this case shows that it is not always necessary to abandon an operation when the tumor is found to be retroperitoneal. In some cases these tumors can be removed without great difficulty and the patient will make a complete and lasting recovery. It may not always be possible to determine which case could be safely operated upon until after the abdomen is open. If the tumor is somewhat movable and the peritoneum not firmly agglutinated to the tumor mass, these tumors can be removed. Sufficient time has not elapsed since my other cases were operated upon to justify reporting them as permanent recoveries.

628 ELM STREET.

ONE FORM OF OVARIAN DISEASE NOT GENERALLY RECOGNIZED: PRIMARY SCLEROSIS OF THE OVARY.[1]

BY

WILLIAM H. HUMISTON, M.D.,

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(With three illustrations.)

IN the various discussions to which I have listened on the subject of chronic ovaritis, I have felt that few men fully appreciated the pathology of chronic inflammation of the ovary.

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

For a number of years past I have been careful to differentiate, both clinically and microscopically, between a chronic ovaritis resulting in a sclerosed organ, and an ovary whose sclerotic condition cannot be, so far as the clinical history and the microscopic examination can determine, the result of a previous cell infiltration, etc., or what we ordinarily term inflammation.

J. A. Shaw-Mackenzie, an English pathologist, said in 1881: "I cannot help thinking, of all the terms applied to inflamma-
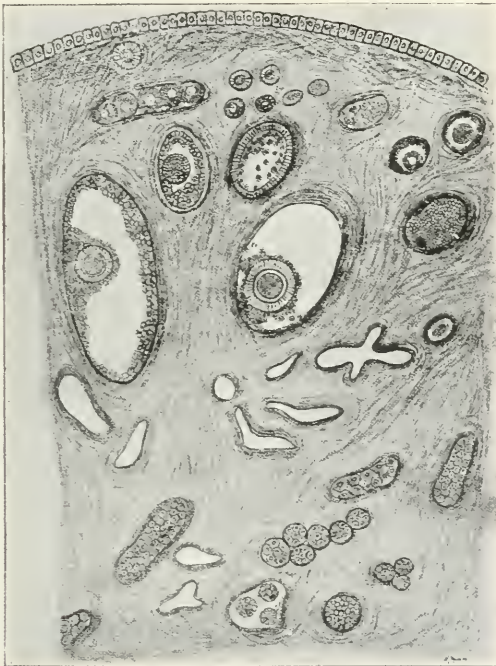
FIG. 1. Normal ovary.

tion of the ovary, cirrhosis is the least desirable," and "I do not think we can take cirrhosis of the kidney as our guide with its pre-cell infiltration and ultimate fibrotic condition." Yet I find a few authors who recognize a non-inflammatory cirrhosis of the kidney, which they call chronic interstitial nephritis; and another variety, in which the microscopic appearance gives evidence of inflammatory changes, they term a *subacute* interstitial nephritis, *merely for the purpose of differentiation*.

One is a primary or non-inflammatory cirrhosis and should

not be termed a nephritis; the other is but the natural result
of inflammatory action. And so I find in the routine exami-
nation of ovaries that there are two separate and distinct
pathologic conditions which can readily be determined by the
microscope: the one a primary or non-inflammatory, and the
other a secondary or inflammatory sclerosis.

The ovaries upon which Shaw-Mackenzie gave his report
were in every instance implicated in a general pelvic inflam-
mation, and were, of course, of the secondary or inflammatory
type: and I agree with him in saying that cirrhosis or sclerosis
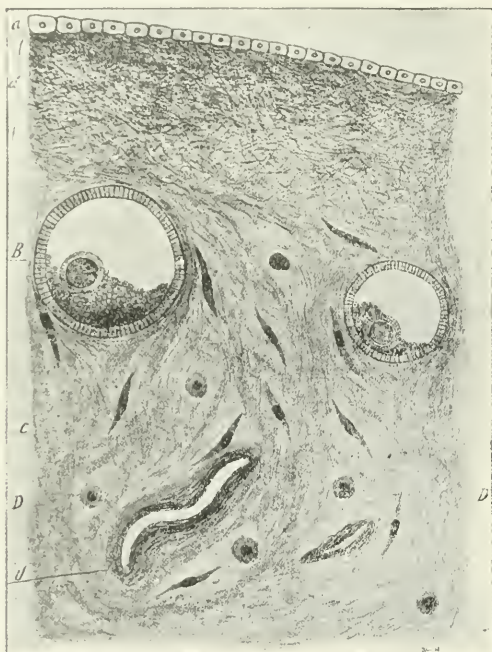
Fig. 2. *Primary or non-inflammatory sclerosis (diagrammatic).*—A, germinal layer
somewhat flattened and with small nuclei; A1, thickened fibrous tunica; B, follicle which
fails to break through the tunica; C, absence of round-celled infiltration—only a few con-
nective-tissue cells with increase of fibrous elements in the stroma; D, a few scattered
epithelial cells of the stroma; U, vessel wall slightly thickened.

is a poor term to apply to a chronic inflammatory change in
the ovary.

I need not occupy any time in describing the gross appear-
ance of these diseased conditions, but will call attention to two
points: first, in a *simple* case of sclerosis there are never any
signs about the tube and the ovary indicative of past inflam-

matory action; and, second, there is not the marked contraction in a chronic ovaritis as in a non-inflammatory sclerosis, and this again corresponds to the gross appearance of the kidney in the so-called interstitial nephritis (or small granular contracted kidney) and the *subacute* interstitial nephritis.

The microscopic differences between the primary (non inflammatory) and the secondary (inflammatory) degenerations are especially quite marked.

In the secondary degenerations we invariably find in a section taken from some portion of the ovary a small round-celled
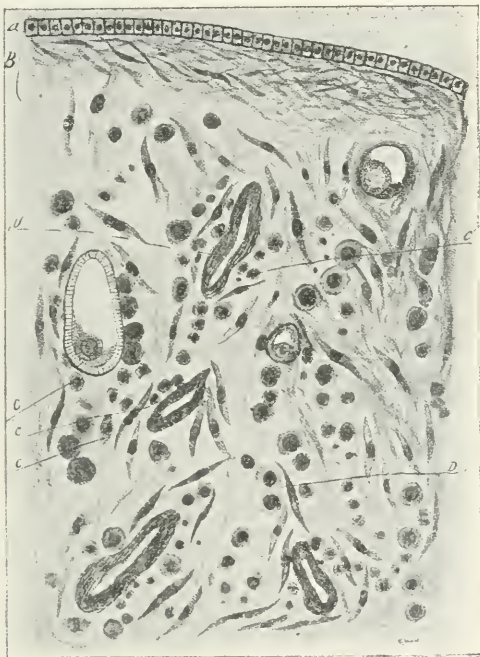
FIG. 3. *Secondary or inflammatory sclerosis (diagrammatic)* —A, germinal layer usually absent and replaced by round cells or connective tissue; B, tunica not much thickened nor fibrous; C, round-celled infiltration with increased nuclear elements as compared with the primary form; few fibrous elements, also; D, epithelial cells of the stroma; U, thickened vessel wall and seen near the surface.

infiltration, or the connective-tissue elements in some of their various stages of development. Also, however advanced the stage of fibrosis may be, the numerical relation of nuclear to cellular elements in this variety is always greater than in the primary form. And, thirdly, the microscopic appearances of the vascular system are also different.

In the inflammatory group we have primarily a dilatation of the vessels with secondary contractions of their greatly thickened walls and a lessening of their lumen.

In the primary group there is usually no thickening of the vessel walls, there is never any dilatation, and contraction occurs so early that you immediately remark the poor blood supply, particularly to the periphery of the organ. In those cases of arteriosclerosis of the vessels within the broad ligament, we usually find the condition extending to the vessels entering the ovary, not otherwise. And, lastly, in the primary group the epithelial cells of the ovarian stroma are diminished in number and usually in size. In some sections they are hard to distinguish from the connective-tissue elements and appear to be undergoing a process of reversion. I would not state this as a fact as yet, but it does frequently so appear.

These several microscopic differences are so constant and so decidedly marked that I have no hesitation in separating them into two distinct pathologic groups.

Just why in these cases the *natural processes* of involution begin at a time when the functional life of the ovary should be at its high tide, and when the ovarian stroma should be thickly embedded with the germ cells in all of their stages of development, who can tell? I had a number of these cases in succession a few years ago, each showing marked sclerosis of the ovarian arteries, and I thought I had solved the problem. This, however, is not a constant factor, not even in a majority of cases sufficient to warrant any such deduction.

I do see, however, in every instance (as my records clearly show) some change in some portion of the body, either one or more arteries undergoing atheromatous change, or, quite as frequently, the evidence of interstitial changes in the kidneys. Osler says that entire families sometimes show a tendency to early arteriosclerosis, and so, too, I have found repeatedly this condition occurring in sisters; and, as Osler aptly remarks, the only explanation that can be given is that in the make-up of the machine bad material was used.

Nothing further can be said of the etiology.

Four years ago a young girl, age 16, came to my clinic. She was well developed, had first menstruated when she was 15 years old, and had seen a slight show but twice during the following year. Instead of making an examination of the pelvic organs at the first interview, I prescribed an ordinary chalybeate mixture. I changed my medication from time to

time, without, at any time during the course of treatment, marking much improvement in her general anemic condition; and although the menses did appear irregularly for a number of times, they were accompanied always with severe dysmenorrhea. Within a year—that is, before she was 17 years old—I examined per rectum, and readily found an unusually small hardened ovary, together with one much larger and firmer than normal, in the cul-de-sac of Douglas.

Just recently I examined a young Slavish woman who was 21 years old. She was married at 20 years of age. Menses were scanty but regular during the first six months, but during the latter six of her married life (when I saw her) she had had amenorrhea. Examination revealed two small, corrugated ovaries, not larger than hazel-nuts, lying low in the cul-de-sac.

These two cases show the possibility of the early age in which aggravated pathologic conditions of the non-inflammatory type of sclerosis can occur. Ordinarily the age of the patients whom I see varies from 24 to 30 years.

While the pathology of these primary sclerotic conditions is of much interest and great importance, I desire more especially to direct your attention to the symptomatology and the diagnosis of this class of cases. So varied and so complex are the symptoms that it will be best to discuss them under the various organs which are found to be usually implicated.

The Kidneys.—The amount of urine passed daily is above the average quantity of the average gynecologic case, but is of low specific gravity, light in color, and of slight acidity. If the case is of long standing there may be a trace of albumin in an occasional specimen. Very few hyaline casts, more often none whatever, are discovered by the microscope, but an increased number of the renal epithelial cells are constant.

The Arteries.—Excepting in the very young, some artery may be found whose walls are distinctly thickened. The arterial tension is often increased. If not obvious to palpation of the arteries, it can be demonstrated by the accentuation of the second aortic sound.

The Stomach and Intestines.—Indigestion and loss of appetite is the rule. Fermentation with the evolution of large quantities of gas gives rise to great pain in the epigastrium and palpitation of the heart with a sense of suffocation. Chronic obstipation with occasional attacks of diarrhea are common.

The Liver.—The inactivity of the liver is noted in the sallowness of the patient, its sluggishness by the pain or tenderness

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induced during palpation, and by the color and odor of the stools.

The *Nervous System* especially feels the effects of the lowered vitality of the whole economy. The patients become easily fatigued, are irritable and sleepless, and soon neurasthenia supervenes, followed shortly by one of the various neuroses.

Of the symptoms relative to the sexual organs, dysmenorrhea, amenorrhea, or delayed catamenia, constant distress with paroxysmal intermenstrual dysmenorrhoic pains are always present. The latter is a most important symptom. All patients describe this pain as being similar in character, and usually in intensity, to the pain accompanying the catamenia (I can only ascribe it to the effort of a mature follicle to make its way through the ovarian cortex), and is the best evidence that the dysmenorrhea is *ovarian* and *not uterine* in origin.

Diagnosis.—The diagnosis of sclerosis or sclerocystic degeneration of the ovaries ought *not* to be made upon the *extirpated organ.* I should refuse to attempt the removal of an organ in any case whose appendages I could not palpate and therefrom determine their condition before operation. The history, however plain, should not be the sole basis for diagnosis and treatment, and I question the advisability of taking a history with that end in view. As in the young Slav of whom I have already made mention, the diagnosis was made upon palpation of the diseased organs, and her history obtained afterward through an interpreter.

The diseased appendage is invariably within easy reach of the examining fingers. The sclerocystic ovary is found to be *globular* in shape and very firm and tense. The small sclerosed ovary a very novice in palpation can discern, and one with a practised touch can, in most cases, feel the corrugations, which I have said before are much more marked in this, the primary or non-inflammatory sclerosis, than in the fibrosis due to inflammatory change.

In brief, sclerosis of the ovary is without a history of infection and is non-inflammatory. It occurs in early life (from puberty to 30). Amenorrhea or delayed catamenia, with dysmenorrhea often since the establishment of the catamenia, and intermenstrual dysmenorrhoic pains always, are constant.

Evidences in not a few cases of a granular and contracted kidney, or some change in the arterial walls, or high arterial tension marked by an accentuated aortic second sound, are found. No evidence of peritonitis. Ovaries (one or both)

prolapsed, firm, unyielding, and globular in form, or small and exceedingly hard and corrugated.

Neurasthenia develops early, but is quickly followed by one of the various neuroses.

Treatment.—For primary or non-inflammatory sclerosis of the ovary, mercury and the iodides together with general tonics have been tried. Local application of poultices and blisters to the abdominal walls in the iliac regions, the painting of the vaginal vaults with iodine, faradization and galvanization to the cavity of the uterus, together with all sorts of almost indescribable methods, have proved of no avail. There is no relief afforded by supporting the prolapsed appendages by the use of tampons or pessaries. I have administered the desiccated ovary without obtaining the slightest effect upon the symptoms and no effect whatever upon the condition. A great deal of stress is being placed to-day (especially by Continental writers) upon the internal secretion of the ovary and its effect upon the metabolism. I am as yet incredulous. I know of no way to relieve this class of patients except by castration.

122 EUCLID AVENUE.

HOUSE-TO-HOUSE OPERATING.[1]

BY

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THE skilled abdominal and gynecological surgeon of to-day is a product of surgical evolution, to which no man ever gave such an impetus as the great and lamented Mr. Lawson Tait. His lines in surgical work were so simple, so thorough, so rapid, and withal so exacting on himself, assistants, nurses, and patients, for pushing rapidly the case to a successful issue or to the best possible result, that we should never lose sight of them, lest we forget that simplicity, rapidity, rigid cleanliness, and thoroughness are to be our keynote of success. He began his work in his private house without trained nurses, and even then had no mean death rate, and gradually lowered the same markedly after training his assistants and nurses to his own fashion. After all of this experience he resorted

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

to house-to-house operating, a most fitting close of his life's work in surgical diseases of women, and food for sober thought, lest we are tempted to go off on a tangent by falling in line with the fad of the day—that of chemical antiseptics, as is only too often attempted to be practised in many of our hospitals.

The fresh air of the country homes, and their hygienic environments, are most important factors that come to our aid in doing house-to-house surgery. I am ready to acknowledge that the surgeon in our line of work, as in others, is improving, and I stand ready to make the same claim for the general practitioner in his ability to care for the after-treatment, assisted by the nurse, aided by the telephone, telegraph, and by rapid transit (if your presence is needed).

There is the mental dread of having to go into an institution, which in many patients brings on post-operative disasters that are undeniably eliminated by operating in their own homes; there is a love of home developed under just such trying circumstances that should not be under-estimated.   How often do we see patients expressing a desire, after being operated upon in a hospital, either public or private, for something seemingly trivial from home, and how matters are helped if the desire is fulfilled!

Iron bedsteads, with other improved household furniture, are found in many rural homes as permanencies, and yet they are not an absolute necessity for any patient who has to undergo a surgical operation.   The late Dr. Alexander Dunlap did four hundred ovariotomies, with a death rate of fifteen per cent, never putting one of his patients on an iron bed; he never saw our modern operating tables with their thousands of improvements, for the greater part of his work was of the pioneer kind.   These operating tables, giving all planes, from standing a patient on his head to the reverse position, found in as many "diving tank" operating rooms, are not superior in results obtained to those of the kitchen table found in any house of the land.   Nor is the showy cleaning of the patient ever to be countenanced, especially while that patient is under anesthesia; such work should be done most thoroughly and most carefully before anesthesia is begun.

The robing of operator, assistants, and nurses in rubber suits and fishing boots, while the audience composing the "outer circle" is looked upon as teeming with dangerous and detestable microbes, is truly degrading to our art; it lowers the

dignity and usefulness of our profession, and is anything but a scientific show. This "outer circle" soon makes up its mind, and justly too, that surely it is not so dirty, for the infected cases still follow notwithstanding the great crying of these would-be "holier than thou" surgeons. Treves has put it well in saying that "such is more allied to a fervent idolatrous ritual brought down to the level of popular performance." The modern smooth-faced rubber-mailed surgeon, of rubber gloves, face mask, boots, hat, and coat, is truly a sight to behold, but not one for emulation either from a scientific or a practical standpoint. He is a walking, self-instigated Turkish bath; and how the dirt with the epitheliated microbes—anal, and possibly urethral and vaginal as well—must pour down, mixed with perspiration, into the rubber wells of boots! This perspiring is certainly not a cleanly process, but it goes on right in the midst of operating, and is promoted and hastened by the wearing of these rubber articles.

My house-to-house work is done on the kitchen or dining-room table in each house, properly arranged by the nurse sent ahead the day before I operate. The doctors invited are not asked if they have taken a bath. They come into the room when we are ready for them, look on, touch nothing in any way connected with the operation, and retire as soon as the patient is put to bed. Frequently some of the relatives desire to witness the operation, and when it is possible you gain by allowing them to do so.

We have no sterilizer to make a display in cleaning instruments or dressings; no baked glass jars for holding dressings, simply the original package; no foot jiggers to cause the hot and the cold water to flow; no glass-topped operating table; no dressing forceps, save those that Nature gave us; no instruments resting in hot water or in antiseptic solution; no blue, red, or white water impregnated with chemicals to produce necrotic tissue; but after washing the abdomen thoroughly with soap and water, then likewise our hands, we apply freely 98 per cent alcohol and then begin our work, using towels that have been dried in the sun and ironed by the help at hand. My results have been all that the most fastidious could desire; and of the houses of different construction that I have operated in, the old log house stands supreme for cleanliness, much to the credit of its occupants, and this same cleanliness was all that I asked for.

Richelot, in a recent article ("On the Relative Value of

Antisepsis and Improved Technique") before the International Gynecological Congress, says that "the very best antiseptic does not retain its value for clinical purposes, and laboratory prognoses are not always to be relied upon. It is found that the use of antiseptics is not only inefficient, but at times dangerous. Hence they have gradually become more or less discredited, whilst sterilization by heat is daily gaining favor." He further says: "The best results are obtained by the surgeon who knows how to use his hands and his common sense. Methods continue to become more and more simplified, and in that way lies progress."

Bumm, on the same subject, says: "The absolute reliance on the protective power of antiseptics has been much diminished by exact investigations, as it has been proved by a whole series of experiments and observations that the elimination of all micro-organisms during the operation has not been attained; there is no way to remove with certitude all micro-organisms from the hands, it is therefore illusory to think that either asepsis or antisepsis can bring about a sterile condition of the wound. In spite of the proved presence of micro-organisms, most wounds heal without suppuration or fever. In addition to this, short operations do not so much tax the resisting power of the wounded tissues as well as the entire organism. To expose the peritoneal cavity during a long time has a well-known bad influence on the heart, the intestines, and the serosa. Asepsis has delivered us of the dangerous application of too many concentrated disinfectants. Antiseptics and improved technique have to go hand in hand—the drier the wound the better are the chances for primary healing." This last statement I want to impress upon you as being a surgical fact recognized for centuries.

The tendency in medicine and surgery is to claim that many individual views are new when the author has been dead for years and years. Let us never fail to honor the memory of those to whom honor is due.

Thorough, rapid operating, under rules of simple cleanliness, will continue to produce more and better results than is possible with the strictest rules of antiseptics; slow, tedious operating, carried out with hesitancy, is always to be condemned.

House-to-house operating means house-to-house isolation, and for this the room-to-room risks of infection in a hospital are lessened to a minimum degree. Surgical cleanliness is surgical godliness, and every time we forget this we add to our

death rate. Chemical perfumes of various kinds will *never* displace soap and hot water judiciously applied in surgery. A strange cat in a strange garret is uncomfortable; and add to this the fact of his being sick, something he cannot help, and you increase his misery. So it is with the majority of the patients operated upon outside of their homes. The average rural home location is not bad, and with scrubbing brush, water, and soap it can be continually made to shine out for the demonstration of surgical truths that are Gibraltars to us and are the indwellings of the people, who have long since learned to love and cherish these in sickness as well as in health. Our best surgery can be given them here, and our reward is to be the lowest death rate possible.

HEMOSTASIS IN THE TUBO-OVARIAN PEDICLE.[1]

BY

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FROM the time the immortal Ephraim McDowell made the operation which marked the birth of ovarian surgery, to the present, the question of hemostasis has been a mooted one. Various methods involving the use of various materials and instruments have been advocated, and yet to-day candor compels the admission that the perfect ligature—a ligature easily rendered aseptic, uniform in tensile strength, reliably and readily absorbable, easily and securely tied—has not been brought forth.

No further proof in support of this proposition need be sought than the increased activity among operators, who, observing and deploring the results of badly acting ligatures, are earnestly endeavoring to find a substitute.

In times but recently passed, operators were so absorbed in perfecting other details of their technique, maintaining asepsis, discussing the advantages and disadvantages of drainage, the merits of the various methods of closing the abdominal wound, and so forth, that they were prone to consider cured a patient who got up from her bed. Now that this technique has

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reached a stage of comparative perfection, there yet remains upon surgery this stigma brought about by unsatisfactory ligatures. To those operators who feel that in some of the various methods they have ideal hemostasis, this paper will be of little interest. Excluding, as being but modifications of fundamental methods, the various means devised by several prominent operators, as well as those methods which discard all means of hemostasis and depend on so-called blunt dissection, as involving too much risk, hemostasis in the ovarian pedicle is secured in one of three ways: first, by ligation; second, by crushing; third, by desiccation.

The non-absorbable ligature *en masse* may be said to have been the primitive method of hemostasis so far as oöphorectomy is concerned. McDowell dragged the ligatures out of the lower angle of the wound [1] in his first four cases, but in the fifth saw fit to cut off the ligature close to the knot, and had his first death from peritonitis—caused, as likely as not, by an infected ligature and the absence of drainage which the long ligature secured.

Penrose [2] says: '' The objections to these ligatures *en masse* are the liability to slip; the difficulty or impossibility in some cases in removing an ovary or a tube; the fact that the broad ligament is puckered up and made more tense than normal, and may for this reason cause subsequent pain and discomfort; an unnecessary amount of tissue is strangulated.'' He charges the slipping of the ligature and its resultant hemorrhage with being a very common cause of death.

Conceding that the ligature may occasionally slip, it seems not quite fair to point to this as a common cause of death. In support of this opinion, the writer may say that in a thousand or more of the earlier cases in which Dr. Joseph Eastman used the ligature *en masse* no hemorrhage or perceptible hematocele occurred.

If the ligature is properly tied with the so-called surgeon's knot, in such a way that, with the exception of the knot, it is concealed in the fold which its pressure makes in the pedicle, and the pedicle properly shaped, there need be no fear of hemorrhage. With regard to the second objection, the day's literature would lead us to believe that instead of striving to remove every vestige of ovary and tube, surgeons are doing their utmost to leave as much as possible of the adnexa; and what a pity it is that during the days of evisceration furor more of this tissue was not left and all the horrible mental

agony incident to an enforced menopause avoided! The two most potent objections to the non-absorbable ligature lie in the fact that, failing to be absorbed or acting badly, it frequently causes more pain than the pathological conditions for which the operation was made, and leaves exposed a raw surface which affords a particularly convenient seat for adhesions of intestines, omentum, or even bladder.

Hughes [3] says: "If the ligatures are small and sterile they become encapsulated and rapidly absorb; if plaited ligatures and large hawsers are used, whether infected or not infected, they are never absorbed." There is nothing so distressing, so calculated to drive a woman mad, as to undergo a severe operation for pelvic disease and then, when she believes herself cured, to find herself in a worse condition than before from an irritating ligature. Indeed, the writer had under his observation a case of a prominent songstress who was driven to suicide by just such pain.

When the drainage tube was in vogue these ligatures frequently worked their way through the tube sinus; but with the growing desuetude of the tube this fortunate issue is not often enjoyed, but the ligature too often reaches the outside through the bladder, vagina, or through other equally unsatisfactory channels. In one case under my observation twelve ligatures were removed from the bladder, while the thirteenth provided the nucleus of a large calculus. A ligature heavy enough to make absolutely sure against hemorrhage in some of the pedicles is too large to be absorbed and large enough to make trouble.

Recently I have not gone to the dealer in surgeons' supplies for my silk ligature material, but have been using a No. 5 silk fish line, which possesses great tensile strength in proportion to its diameter, yet is not so fine as to cut, as may occur in tissues long the seat of inflammation. It seems to be readily absorbable. "The fine silk ligatures used in ligating the pedicles become encysted in lymph and remain inoculate. The knotted portion of the ligature remains unchanged, but the loop, if it is a long one, is often dissected apart into its ultimate fibrils by the leucocytes, when the silk is not absorbed, as can always be found." [4] I prefer the use of this ligature in pustube cases, as I nearly always see fit to ligate the pedicle in sections. I prefer it in these cases to catgut because of its greater tensile strength and because of the security of the knot.

It has been indeed interesting to observe the increased use of catgut. Operators who four years ago condemned it in the

strongest terms as being impossible of sterilization, dirty, un-
reliable, too quick to absorb, its knots too liable to untie, are
to-day lauding it to the skies and using it in many cases alto-
gether. And yet there must not be lost sight of the fact that
some very able operators still cling to silk as a ligature, ope-
rators who are daily at work, who have unlimited means for
sterilization, and whose results any of us might be proud to
equal. The failure of catgut in former years was due princi-
pally to the fact that no reliable means of rendering it aseptic
had been devised. Numerous methods were brought out, tried
in a few cases, the gut found aseptic, only in the next few
cases to give rise to the most virulent infection. To-day it is
not a difficult matter to secure aseptic catgut.

There remain, however, a few objections to this ligature
material. But rarely will catgut withstand the tension neces-
sary in drawing a double hitch. Consequently a single hitch
is necessary, with its liability to slip before the second knot
can be drawn down, although the tendency of this ligature to
untie is avoided by making use of several knots. So far as the
too rapid absorption of catgut is concerned, chromic catgut has
done away with this objection; and yet, as an indication of
what might occur in the ovarian pedicle, I have known chromic
catgut, after two or three weeks of douching, to come away
quite unchanged from a pedicle in vaginal hysterectomy.
Again, not infrequently catgut ligatures have been charged
with lack of tensile strength when the fault lay, not with the
ligature, but with the operator's too long finger nails. Even the
best gut ligature may be rent in twain by long, sharp finger
nails.

After using catgut prepared by himself, by several different
methods, and that prepared by different concerns, the writer
has been using with confidence that made by a certain firm
whose catgut has proved quite reliable, with the exception that
an occasional bottle is found which is shredded, thus depriving
it of that strength deemed necessary against hemorrhage.

Taking into consideration the difficulty in rendering catgut
aseptic and the skill required in properly tying it, one seems
justified in the conclusion that this is not the ligature for the
infrequent operator, who, not using enough catgut to warrant
much attention in keeping it aseptic, and lacking the constant
practice necessary for good ligature-tying, will not find as good
results as from properly selected silk.

Within the last few years there has been manifested on the

part of not a few operators a determined effort to get away from any and all kinds of ligatures, on the ground that ideal hemostasis could not be secured by this means. The fundamental principle in ligature hemostasis is pressure. The ligature affords continuous pressure, whereas it may be said that the ideal hemostasis should be had by some means exerting for a short time only a pressure sufficiently powerful to obliterate all vessels. To the disadvantages enumerated against various ligatures it may be added against all of them that ligature-tying in the abdominal cavity requires a great deal of skill. It is a matter of wonder how some beginners, after having seen a few sections made, and with no experience whatever in ligature-tying, are able to extirpate a pus tube from its bed without having a fatal hemorrhage. To dispense with the other objections to ligatures, rather than with the difficulty of tying, Doyen, Tuffier, and Thumin have devised instruments which depend for their hemostatic effect upon the exertion of enormous pressure upon the vessels.

According to Bissell,[5] "the vessels at the point of greatest pressure have their inner tunics ruptured, which incurvate, resulting in the formation of a clot. These facts are essential to the understanding of the subject—viz., a systematic application to tissue *en masse* of pressure sufficiently great to immediately and permanently check bleeding from all vessels within compressed area."

The method is new, and while it numbers among its advocates some very able men—as, for instance, Landau, who reports 27 cases without a death—it is yet too early to give to these instruments a permanent place in our armamentarium.

However, those who have used it express themselves in terms of strong approval. Stone[6] states that the angiotribe as a compressor is nearly perfect in its actions. However, he says "that in all necrotic tissues or in myomatous or omental structures its work has not been altogether satisfactory, and further study of its action is necessary." Bissell[7] calls attention to the fact that "there must always be sufficient structures between the organ or tumor and the remaining tissue to be completely surrounded and compressed. Weak, degenerated, or friable tissue, such as we find in malignant growths, breaks down easily under pressure and bleeds."

While many of the users of the angiotribe indorse it as an excellent instrument, this opinion is not universal; as, for instance, Grandin,[8] in discussing Cleveland's paper, says: "It

seems to me, however, that it is an innovation which departs from well-established laws of surgery. I see no use for this new instrument. I am upholding the surgical practice of tying a vessel against the practice of burning or crushing a mass of tissue and leaving it in the abdomen to necrose. The principle on which this instrument works is fallacious, and it comes to us from the prolific ground—Europe—from which so many false gods come to us."

Ratchinsky [°] says: "The angiotribe cannot always be fairly applied, and in some instances retention forceps and ligatures must still be required." He further concludes that angiotripsy with Tuffier's instrument is thoroughly practicable, but that the hemostasis is not always permanent. While the principle is correct, the failure to obliterate large vessels exposes the patient to unnecessary risk.

Years ago Keith, appreciating the disadvantages of the ligature, devised his clamp-and-cautery method in dealing with the pedicle, and to this procedure is due a great portion of the credit for his then unheard-of and unequalled record. This method was not followed by other operators to any considerable extent, probably on account of the manual dexterity required in properly carrying it out, and because those who attempted it did not realize that its results did not depend upon cauterization, but upon desiccation, and that a red-hot cautery will cut an artery and leave its lumen as little occluded as if done by a sharp razor.

Having in view the unsatisfactory results of ligatures and disadvantages of the cautery, Skene set out to perfect an instrument for hemostasis and brought forth his electro-hemostatic forceps. This instrument has been in the operating room for such a length of time that an opinion may be formed as to its merits. It is too well known to require any detailed description, except to emphasize the fact that its efficiency is had, not through charring the pedicle, but rather by desiccating or cooking it. The larger forceps is so constructed as to give a considerable degree of pressure, and thus in a measure combines both the good points of the angiotribe with the advantages of desiccation. I have used this instrument a considerable number of times, and while it will not prove satisfactory in all cases, I believe that if used with judgment it cannot fail to be a valuable addition to any surgeon's armamentarium. I must confess that it was with some misgiving that I dropped my first pedicle, a rather large one, after having used this forceps,

but a few cases gave me such assurance that I now dismiss them with as little fear as when a ligature is used. It absolutely does away with sloughing tissue beyond ligatures. Used in pus-tube cases by the application of another traction forceps, it is possible to prevent the escape of pus, as sometimes occurs when the distal end is severed. It should be applied in the long axis of the superior border of the broad ligament, and on removal leaves but a small, thin membrane of cooked tissue. Here at once becomes apparent a most desirable advantage of the instrument. It does not put the broad ligament on a severe strain, thus giving rise to great pain immediately after the operation and sometimes for years subsequently. There is no considerable mass of tissue held in the tight grasp of a ligature pressing on a sensitive nerve, for the nerves are devitalized; nor is there danger of a Fallopian tube becoming patent, with its resultant secondary inflammation of stump and formation of adhesions. This is perhaps the only method by which these results can be avoided. Patients are peculiarly free from pain after these operations. On one occasion, where, in a pus-tube case, the tissues were rendered friable by inflammation and my ligature seemed to cut, I was enabled to use this forceps with most agreeable results. Its greatest disadvantage seems to lie in the fact that it cannot be used away from electric currents, as storage batteries are too cumbersome for transportation. Indeed, it seems to be an ideal instrument.

To summarize: 1. The silk ligature is still used by many operators of ability. 2. A silk ligature of proper size has some advantages over catgut. 3. The silk ligature is the ligature for the beginner and infrequent operator. 4. Given an aseptic, strong catgut ligature, it is perhaps the best for the skilful ligature tyer. 5. The angiotribe represents a step in the right direction, but is not yet perfected. 6. The electro-hemostat lacks but little of being an ideal hemostatic, and should come into general use in the treatment of the tubo-ovarian pedicle.

In conclusion, the writer is of the opinion that he will have best success with the ovarian pedicle who confines himself not blindly to any one method, but rather uses a wise discrimination between the various methods now at hand.

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TECHNIQUE OF ABDOMINAL HYSTERECTOMY.[1]

BY

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(With three illustrations.)

MANY plans of operations have been suggested and prac- tised which are matters of history, and before an audience of this kind it is not necessary for me to take up your valuable time and review all the different methods which have been in vogue. The long dispute between the extra- and intraperito- neal treatment of the stump has, it seems to me, been decided in the last five years in favor of the latter, but this again is subject to variations. Some advocate total extirpation of the uterus, including the cervix, while many advocate leaving the cervix in. I have always favored both operations, according to the case.

In case of fibroids, complicated or not with tubal disease, where the cervix and mucous membrane were perfectly healthy, I have always been in favor of leaving the cervix: first, because the operation can be performed quicker and easier; second, there is a better pelvic floor; third, there is a better vagina and less tendency to senile atrophy; fourth, the operation is less dangerous, perhaps less tendency to septic infection.

When, however, the mucous membrane of the cervix is dis- eased, or there is laceration of the cervix, or if the case is malignant or there is any suspicion of malignancy, I think that the total removal of the uterus, including the cervix, will give us the most permanent results. I have seen many cases,

[1] Read before the American Association of Obstetricians and Gynecolo- gists, at Indianapolis, September 19–21, 1899.

some operated upon by myself, after the old extraperitoneal method with the clamp, which were followed by discharges from the cervix, causing great distress, and in some cases I have been obliged to remove the cervix to effect a cure. I would like to make this point very strong, that in diseased conditions of the cervix the rule should be total hysterectomy.

My technique, in short, is as follows: The patient is prepared in the usual aseptic manner, especial care being given to the vagina, because we frequently are obliged to introduce instruments and our fingers into the vagina to facilitate the
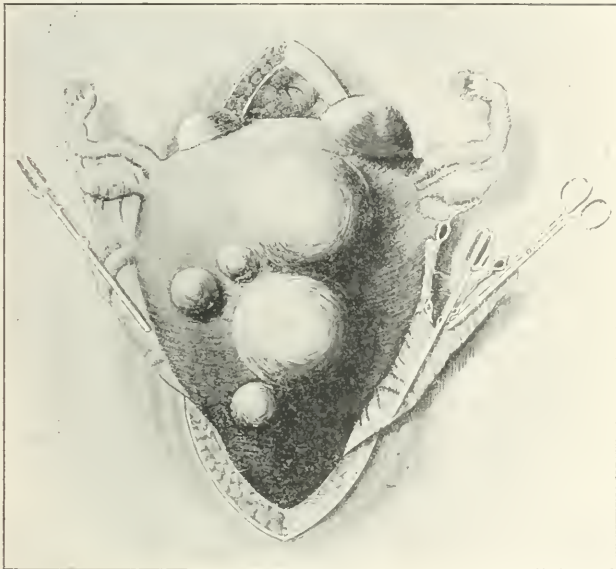
Fig. 1.

operation. With the patient in the Trendelenburg position, I open the abdomen in the usual manner. The intestines are kept in place by abdominal towels. A corkscrew is introduced into the uterus and the latter pulled out of the abdominal cavity. Two large, strong clamps are now placed on each of the broad ligaments outside of the ovaries, including the round ligament, and down as far as I can get them to the cervix. Between the clamps and the uterus the broad ligament is now severed about one centimetre from the clamps down as far as the latter extend on each side (Fig. 1). With a knife an incision is then made across the uterus (a little above the attach-

ment of the bladder) through the peritoneum. The bladder
can now be easily separated from the uterus and kept out of
harm's way by a retractor or abdominal towels.

Two other clamps are now placed on each broad ligament,
from the places where the other clamps stop, downward to about
the cervix. These clamps control the uterine arteries on each
side. By again cutting between the clamps and the uterus the
latter is separated almost entirely. The slight attachment in
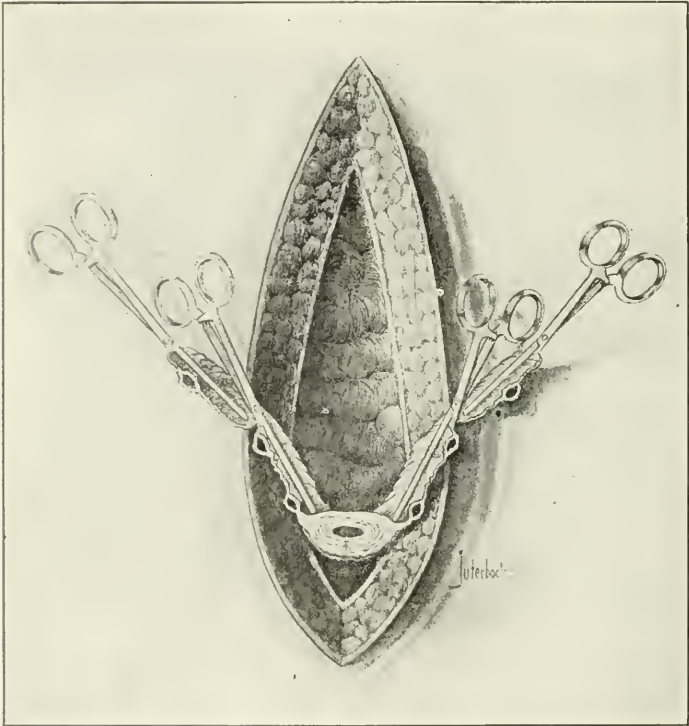
Fig. 2.

the rear to the vagina and anteriorly is now easily severed and
the whole uterus, including the cervix, removed (Fig. 2).

I now have four clamps containing all the blood vessels,
which I pick up one after the other and ligate. When the
blood vessels—that is, the two ovarian arteries and two ute-
rine arteries, and, if necessary, the two arteries of the round
ligament—are firmly tied I take off the clamps. I may find a
few oozing points which may require a separate ligature, but,

as a rule, do not. I then pull the peritoneum over the stump, and with a running catgut ligature, beginning at the side, cover it smoothly down to the vagina. The other side is prepared in a similar manner. If there is much oozing from the edge of the vagina, I sometimes place a running suture from one side to the other in order to control the little bleeding, but this is seldom necessary. I sometimes leave a small opening in the vagina (about one centimetre), through which I put a small piece of gauze, a kind of safety gauge. I hardly think that it is necessary always, and it may be better not to do it, but I think it removes the fluid from the abdominal cavity and convalescence is quicker. I leave it in from three to ten days. The abdominal incision is closed in the usual manner, in layers.
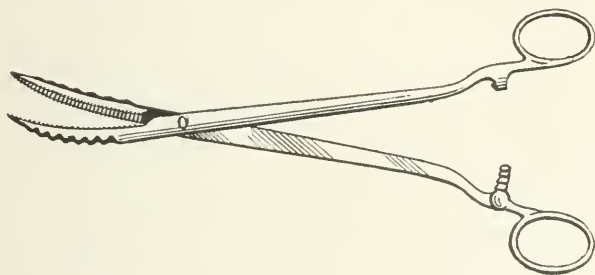
Fig. 3.

with dry sterilized catgut; and let me say that I now use exclusively the dry sterilized catgut—No. 3 to tie pedicles and sew up the abdominal wound : No. 1 I use for intestinal surgery and to sew up the peritoneum only. I use this in all septic cases. In cases complicated with pus tubes, tubercular condition, malignant growths, or any other septic condition, I do not sew up the abdomen with catgut, but use the figure-of-eight silkworm-gut suture.

If I want to leave in the cervix I proceed as follows: After having placed the first pair of clamps on each side and made my incision as far as the first clamps extend downward, I put another pair of clamps on, but not down as far as in the first case. I also cut between the clamps and the uterus down to about the external os on each side, cutting the peritoneum from one side to the other, separating the bladder, and then making a V-shaped incision in the uterus. With the anterior and posterior flap just below the internal os, the uterus is now separated in a moment. As a rule the uterine arteries are

not cut, but the anastomotic branches are, and these require ligaturing as well as the two ovarian arteries, and, for safety's sake, the arteries of the round ligament are also ligated. With a running catgut ligature I bring the two flaps of the cervix together and cover this and the stumps of the arteries with peritoneum.

If there was a pus tube and other septic conditions which I think advisable to drain, I puncture with this instrument—Fig. 3. which I have devised for that purpose—the posterior cul-de-sac.   By spreading the instrument I can make the opening as large as I want to and pull a rubber tube or piece of gauze through for the purpose of drainage.   I prefer not to drain. Drainage is not ideal surgery, but I am positive that in many cases drainage will save life and shorten the period of convalescence, and I had rather have a live patient than ideal surgery.

This operation with a little practice can be so quickly performed that the shock of abdominal hysterectomy is no more than in simple ovarian tumor.   Within five minutes from the beginning of the operation the tumors and the uterus are removed; the ligation of four vessels, covering over with peritoneum, the introduction of the drainage tube if necessary, and the closing of the abdomen, can be easily done in fifteen minutes more.   Of course very complicated cases with extensive adhesions require a longer time, and I would not want to be quoted as saying that every case of abdominal hysterectomy could be finished in twenty minutes, but nearly all can in half an hour.

It is hardly necessary to say that in complicated cases the adhesions must be loosened first, or if a fibroid is in the broad ligament it must be enucleated before the clamps are applied. The angiotribe may take the place of ligatures, but we need more experience with it before we can decide its real place in abdominal surgery.

Conclusions.—1. In abdominal hysterectomy, clamp the broad ligaments and remove the growth and uterus.

2. Ligate the four blood vessels separately.

3. Carefully cover all raw surfaces with peritoneum.

4. In cases without tears and healthy mucous membrane, leave in the cervix.

5. In any diseased condition of the cervix and malignant growth, perform total hysterectomy.

POSTPARTUM REPAIR OF LACERATIONS OF THE CERVIX UTERI.[1]

BY

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PROBABLY few physicians have a clear idea of the injury to the cervix uteri in many cases of what are considered normal labors. My reasons for this belief are based upon my personal experience in past years, before I realized the frequency of cervical injuries, and it was only after careful investigation of a number of cases with a Sims speculum that I began to appreciate how very serious their injuries may be and still cause, for the time being, so few symptoms. The text books and writers on gynecology merely mention the fact that lacerations of the cervix uteri frequently occur in varying degrees at the time of labor, but the subject is dismissed in a few lines and no mention is made of the necessity of a careful ocular examination of the parts. Nearly all agree that lacerations that are allowed to heal by granulation result in the formation of scar tissue, causing hypertrophy, hyperesthesia, disturbed function, and troublesome reflex symptoms.

The common opinion is, also, that an old, unhealed laceration of the cervix, covered with granulation and bathed in a muco-purulent secretion, is a common exciting cause of cancer of the part. It is a fact that cancer of the cervix is extremely rare in women who have never been pregnant, for I have never seen such a case. Emmet has also placed upon record that at the time he published the first edition of his work on gynecology, all the cases of cancer of the cervix that had entered his private hospital, or had come under his observation suffering from an epithelioma of the uterus, had in every instance been pregnant.

In late years I had nearly given up the practice of obstetrics, for my time and energies have been occupied in surgical matters; but the few women whom I have attended in accouchement I have carefully examined with a Sims speculum,

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

in order to determine the extent of the injury, if any, and I have been amazed at the extent of the lacerations. In several instances the rent extended laterally into one or both of the broad ligaments sufficiently far that three fingers could be easily laid in the gap, the torn space being filled with blood clots, fragments of membranes, and débris; and before the exact nature of the injury could be appreciated all the mass of refuse had to be sponged and wiped away. It is a fallacy to think that a correct diagnosis of a laceration of the cervix or perineum can be made by a digital examination.

In many cases the parts have been so much overstretched and bruised and swollen that the information given by the sense of touch is very indefinite and unsatisfactory, and it is by an ocular examination only that an intelligent opinion can be gained. I doubt not that if any of the members of this Association who attend women in confinement will take the trouble to examine properly the next half-dozen cases under their care, they will be surprised at the number and extent of the injuries found. The examination should be made within twenty-four hours following delivery, and, unless there be great exhaustion or some other good reason, it should be made within an hour or two after the birth is completed. The examination should be made in such a manner as to cause very little annoyance or discomfort to the patient; and if good reasons are given the patient, and the statement made that it is important that she be left in as perfect a state as possible for her future health and usefulness, no objections will be raised. The danger from an examination need not be seriously considered, if it is taken for granted that the accoucheur, the nurse, and the appliances are positively clean—that is, clean from a surgical standpoint.

If it can be arranged, it is much better to lift the patient on to a table, but if this is not feasible the examination can be made upon the bedside; but, in any event, a good light is indispensable—either an electric or sun light, or, in an emergency, a kerosene lamp. All instruments should be boiled before using, also the water used in washing the hands or the patient. The patient should be placed in the left lateral position, and, after a digital examination, a Sims speculum should be introduced, and, with a forceps and absorbent cotton, blood and secretions removed from the vagina; and now, by seizing the anterior lip of the cervix with a bullet forceps, the cervix is under control and can be drawn down, if needed, so that all

parts can be easily seen and any rents wiped dry and in-
spected.   If the injuries are severe, and especially if the tear
extends beyond the cervix into the connective tissue, it should
be repaired at once.   Any ragged or irregular surfaces should
be trimmed away with scissors and the parts united with inter-
rupted sutures of formalin catgut.   The woman should now
be turned upon her back, and any injuries of the perineum
should be repaired with silkworm gut and perforated shot, the
ends of the sutures being cut off on a level with the shot, each
shot having attached to it a tag of strong black silk thread an
inch in length to facilitate the removal of the sutures.   After
carefully douching out the vagina and afterward drying it as
perfectly as possible, the vagina is filled, by means of a tea-
spoon, with a preparation that has been of great comfort to
my patients and of immense satisfaction to myself.   To each
ounce of freshly and properly made oxide of zinc ointment are
added a grain of morphine and a grain of cocaine.   The va-
gina is filled with this mixture, and a large teaspoonful is also
introduced into the rectum, which usually suffers more or less
in the process of childbirth.   The woman is now put to bed,
and, with the exception of douching off the vulva after urina-
tion, no treatment is required.   The presence of the ointment
in the vagina, slightly astringent and soothing, favors the
healing by first intention, and no vaginal injection is per-
mitted and no manipulations required.   The gradual oozing of
the ointment keeps the repaired perineum protected and pre-
vents any urine from entering the vagina or contaminating the
perineal wound.   At the end of nine days a vaginal douche of
warm carbolized water is given and the perineal sutures re-
moved, the black silk tags in the shot materially facilitating
the location and removal of the sutures without undue separa-
tion of the newly united parts.   No attention is paid to the
cervical sutures.   The results have been all that could be de-
sired: the parts have healed kindly, and the women have
been restored, as far as the cervix and perineum are concerned,
practically to the condition they were in before impregnation.

  What has been said might leave the impression that the
repair of the cervix post partum is an undertaking of some mag-
nitude.   Not so; it is simplicity itself.   In anticipation of the
apprehended injuries, the patient, at the orders of the medical
attendant, provides beforehand the necessary remedies and
appliances, so that in case of need no time is lost; and this
preparation also gives the woman to understand that nothing

is left undone to provide for her safety and security, increases her confidence in her physician, and renders her more willing to submit to whatever may be thought best for her. Anesthetics are not ordinarily needed for the repair of the cervix. Happily for woman, during the child-bearing period of her life the cervix is one of the most insensitive parts of the body, and now the sensations of the part are still more obtunded by the pressure; the stretching and the tearing render the introduction of the sutures, if not painless, at least tolerable. Not so the perineum, for it is one of the most sensitive parts of the body, and the last to lose sensibility under ether, but its sensibility is greatly lessened by the task imposed upon it by childbirth. The judgment of the physician will decide upon the necessity of anesthetics, and must depend upon all the facts in the case. If we are to judge of the danger to life and health of the comparative importance of lacerations of the cervix and perineum, we must certainly decide that the cervical injuries are by all means of the most consequence. Cancer of the perineum is rarely heard of, cancer of the cervix of daily occurrence.

I am the more willing to present this subject for consideration and discussion, firstly, because I believe it to be a matter of importance, and, secondly, I am not aware that it has been heretofore presented.

1607 I STREET, N. W.

CHOICE OF METHOD FOR TOTAL HYSTERECTOMY, AND SOME POINTS OF TECHNIQUE.[1]

BY

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IN 1895 I returned from Paris after a residence of ten years there, and having seen a great deal of vaginal hysterectomy by the clamp method in my hospital service, and being its enthusiastic admirer, I praised it as an ideal operation, easy of performance, and largely devoid of the dangers attending the operation by the abdominal route. In France it is universally

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19-21, 1899.

accepted and generally practised, and in the hands of Prof. Gustave Richelot has shown a favorable rate of mortality which has never been equalled by the abdominal operation. In this country it has, here and there, won an admirer and advocate, but has failed of popularity, and for some time I was at a loss to understand why. Fuller acquaintance with the technique and results of the abdominal operation in the hands of my American colleagues has not only enlightened my mind as to the reason, but has converted me to the American operation of abdominal hysterectomy for many and, I may say, the majority of cases in which I formerly practised the vaginal route. The evolution and perfection of the technique of abdominal hysterectomy is distinctly American, and until the publication in Paris by Prof. Paul Ségond of its details, after his visit to this country, the American operation was almost unknown in France.

My change in opinion and procedure has been slow and reluctant, and results from conviction, as, point by point, I have been led to see the manifold advantages of an open field for determining the conditions present, offering freedom for manipulation, and the better conditions for doing a complete operation. I first decided that cases complicated by firm adhesions were better handled through the abdomen; this left pus, cancer, and simple cases (in which I include small fibroids) for the vaginal route. Later my natural desire for conservatism persuaded me that the simple cases, if operated through the abdomen, offered the possibility of preserving the central organ and possibly one of the appendages, which I look upon as of vital import to the well-being of women of younger years. There remained then only pus and cancer cases. Now I am fully satisfied that after the removal of diseased cervical tissue and the proper preparation of the uterine cavity, the removal of a cancerous uterus by the abdominal opening offers better promise of success, as it affords the opportunity to examine and remove any of the affected glands, as well as any suspected portion of the broad ligament.

Vaginal hysterectomy, for me, has therefore resolved itself into an operation of choice for dealing with pus cases, and this comprises the enlarged and soggy uterus of metritic or puerperal origin, with or without complication of the appendages, for the removal of which vaginal hysterectomy is an ideal operation.

The superior advantages offered by the vagina for natural

drainage, together with the protection this route offers to the barrier which Nature usually sets up between pus accumulations in the pelvis and the abdominal cavity, have held me a partisan still to the vaginal route for the treatment of extravasated pus tubes, perimetritic and pelvic abscesses. The criticism can truthfully be made that in the presence of these conditions in their worst forms the operator does an incomplete operation, in so far as he leaves undisturbed some adhesions which may later necessitate a second operation through the abdominal wall, and, in some instances, more or less diseased tissue which sloughs away in the drainage and prolongs the after-treatment and convalescence; but those who have had experience in the handling of these cases by both methods will, I feel confident, bear me out in the statement that vaginal hysterectomy is a life-saving operation, and the importance of this consideration outweighs all others in my mind. The foregoing reasons are equally cogent in persuading me that certain cases and conditions of pelvic abscess are best treated by vaginal incision and drainage, even if necessary to follow later with a radical operation. Given the choice, I believe any patient will elect two operations offering greater security to life than one where the outcome is a matter of *prognosis infausta.*

The advantages claimed for vaginal hysterectomy are, briefly —arranged in the degree of their importance—that the operation is attended with a less percentage of mortality than the abdominal operation; that it occupies far less time in its performance with clamps, with consequently less shock to the patient; that it is practically never followed by hernia; that it offers natural drainage downward, which is important in pus cases, and equally permits of daily flushing and cleansing of the field of operation, which is an important factor in the elimination of pus and pockets and tends to final closure without adhesions; that it avoids the abdominal scar, which is unsightly if closed with the through-and-through suture or by interrupted superficial sutures of silkworm gut, and is a source of annoyance to some women and in a certain proportion of cases gives rise to hernia.

The disadvantages are—danger to the ureters, which vary in their anatomical relations; danger to the intestine and bladder; difficulty in the ready control of all oozing, which is a vitally essential point in the technique; the great pain suffered by the patient during the forty-eight hours that the clamps remain; and the time and trouble necessary to the proper daily dressing

of the patient over a period of from fourteen days to six weeks, depending upon the conditions present.

The importance of the after-treatment of these cases has been generally overlooked and misunderstood by American surgeons, and, as regards the ultimate recovery and favorable results, this is as important as is the technique of the operation itself. The reason for this oversight is easily explained. The clinics are open to all without question in Paris, but a visitor, to follow the cases in the wards and daily see the dressings, must obtain the consent of the hospital administration, which is difficult and is seldom accorded. I have seen a host of my American colleagues present at the operations in my hospital service in Paris, but only rarely one that had sufficient interest to secure the entrance into the hospital wards, come daily at 7:30 in the morning, and go through the day's routine. They all became familiar with the technique of the operation, but very few learned the details of the after-dressing of these cases. No case, in my opinion, can be properly douched and dressed on a bed-pan in bed. The patient should each time be placed on the operating table in the operating room, or dressing room if one be provided, and with the advantage of an open field brought into view by retractors in the hands of an assistant, with a good light and perfect asepsis, thoroughly and carefully douched with permanganate, hydrogen dioxide, or other antiseptic, and redressed with drainage of iodoform gauze, and the vagina carefully but not too tightly packed with the same material. It will readily be seen that this is a laborious and lengthy operation, which, so far as I am concerned, cannot be entrusted to the hands of a nurse, no matter how competent, and must be confessed has had great influence in my relegating the operation to the saving of life only.

This brings us to the consideration of a point of cardinal import in a choice between the two methods. There is in every case of vaginal hysterectomy by clamps a sloughing of the necrosed tissue, resulting from the pressure of the clamps; and if the operation is in the presence of purulent conditions, the discharge is likely to be increased. Thus one cannot escape the reflection that, if the mortality rates in surgery are more largely dependent upon aseptic conditions than upon any other one factor, then it is certainly necessary to exclude from our hospitals septic cases that are a constant menace to the other inmates.

In controversion of the opinion I have heard generally expressed, I believe that vaginal hysterectomy is a more difficult operation than abdominal hysterectomy, requiring a more delicate touch and manipulation, intimate knowledge of all the hidden parts involved, which is only acquired by experience in the operation, and that the successful treatment of conditions encountered, which are never twice the same, demands greater dexterity and what is termed surgical sense in its best definition. Moreover, you are likely to have complications in or following this operation when least expecting them. In my last case, which was non-adherent, I had a fecal fistula resulting from rubbing of the bowel against the point of one of my forceps, causing a necrosis which opened on the fifth day, closing, however, in due time of its own accord, as the majority of these fistulæ do.

In my radical change of opinion as to the field of usefulness of vaginal hysterectomy, I find myself in the distinguished company of some of its best known teachers and former advocates. Prof. Paul Ségond, returning to France after his late visit to this country, read a paper before the Paris Surgical Society, and published in the *Revue de Gynécologie*, entitled " Abdominal Hysterectomy for Large Fibroids, and the Superiority of the American Method over All Others." Jacobs, of Brussels, came to this country on a missionary tour to convert American surgeons to vaginal hysterectomy; he returned a convert to our suprapubic operation, and recently told an American surgeon visiting his clinic that he considered it the operation of choice for the total extirpation of the uterus and its appendages.

The American operation has the great advantage of simplicity over the methods called after the names of Richelot, Doyen, and Le Bec, of Paris, and Martin, of Berlin, which operations are the best known in Europe.

The Richelot operation consists in the liberation of the cervix from its vaginal insertions through the abdominal opening, commencing by the dissection off of the bladder, seizing the vaginal portion of the cervix, after complete liberation, and drawing it up and forward into the abdominal cavity, and then progressively cutting and tying the broad ligaments from below upward, and finally delivering the uterus and adnexa entire. The opening into the vagina and the cut borders of the broad ligaments are then approximated and closed by interrupted catgut sutures, instead of the simpler and more

quickly accomplished continuous suture of the American method.

Doyen's method resembles that of Richelot, except that he commences on the posterior aspect of the cervix, opening into the posterior vaginal fornix, and draws the cervix backward and upward into the abdomen. This maneuvre is exceedingly awkward and difficult when you have a short vagina and a deep, narrow pelvis.

Le Bec's method, used chiefly for fibroids, is a compromise on the combined method, so-called, of vagina and abdomen. He commences through the abdomen by ligation of the ovarian vessels, at both the inner and outer sides of the ovary, through an opening made in the transparent portion of the broad ligament; then, after dissection off of the bladder in front, goes again through the opening in and behind the broad ligament, and carries his ligature through into the vagina and back again over the anterior surface of the broad ligament, and ligates the uterine arteries on each side. Commencing from above, he cuts the broad ligament down to his ligature on the uterine artery, both sides, amputates the uterus at this point, then dissects out the cervix, leaving sufficient tissue to form a stump on each side to prevent the slipping of his ligature on the artery; he then draws these stumps down into the vagina by the aid of the loose ends of his ligatures, left long for this purpose, sutures the peritoneal surfaces together from the abdominal side, in uncomplicated cases, shutting the stumps, with their ligatures, into the vagina.

Martin's method resembles that of Doyen, with the difference that he commences by the liberation of the uterus from above downward, to and including the uterine artery; then by the vagina he forces a long pair of pointed forceps through the posterior cul-de sac into the peritoneal cavity, enlarging this opening by lateral incisions, thus freeing the uterus from its posterior vaginal attachments. He then stitches the border of the vaginal incision to that of the peritoneum with interrupted catgut sutures, knotted on the peritoneal side, with the ends left long, which arrests the hemorrhage from the posterior and lateral recurrent arteries; he then carries his first incision around the cervix in front to the opposite side, frees the bladder, completes the anterior opening into the vagina, and delivers the uterus. He then carries the long ends of the interrupted sutures on the posterior and anterior incisions down into the vagina, closes the peritoneum with continuous catgut

sutures from the abdominal side, and from the vaginal side sutures the vaginal mucosa together.

This brief description of the leading European operations is sufficient to show the greater perfection and simplicity of technique that marks the American operation, the details of which are too well known to bear repetition here before this distinguished society. So far as my observation has gone, the leading operators seem pretty well united in their methods of procedure in the abdominal operation, excepting possibly more or less pronounced difference of opinion, still existing, as to the indications for doing a total extirpation or for leaving the cervical stump.

I believe there are a number of reasons why the cervix should be conserved in this operation:

1. In its removal you always encounter a smart hemorrhage from the recurrent lateral and posterior vaginal arteries, which to properly secure and close, in the closure of the opening into the vagina, prolongs the operation from some moments to a half-hour, according as the pelvis is deep and narrow or the abdominal walls thick and rigid.

2. The liberation of the vaginal insertion to the cervix demands that the operator shall keep in close proximity to, and even encroach upon, the cervical tissue to avoid injury to the ureters, and a slip or misstep may cause irreparable mischief.

3. In many women the os and cervix is the principal seat of sexual pleasure, and its removal may seriously affect the future marital relation.

4. I believe the cervix is an integral part of the pelvic floor and necessary to the preservation of its normal functions.

5. The opening from the peritoneal cavity into the vagina increases the chances of infection, no matter how carefully the vaginal disinfection may have been prior to the operation.

It may be claimed that the leaving of the stump endangers the peritoneum anyway through the cervical canal; but I have found that if in its amputation the incisions are made in a decided V-shape, apex down, and the canal thoroughly sterilized by drawing a strip of gauze through it from above downward, soaked in pure dioxide of hydrogen or bichloride, and then the two V-shaped flaps firmly stitched together and the peritoneal borders stitched over above, this danger is obviated. All the steps of the operation are greatly facilitated by the Trendelenburg position.

Where hysterectomy is done for malignant disease the whole

of the organ must, of course, be sacrificed; and there are cases of tubercular disease and gonorrheal infection, where the endometrium entire is suspected, in which it may be unwise to leave the cervix; also, if the liberation of extensive adhesions or the removal of a widely adherent fibroid leaves raw, oozing surfaces which cannot be covered and must be drained, the vaginal drainage may be more important than the conservation of the cervix; but so far, I must confess, I am strongly inclined to preserve the cervix in every instance possible.

There are a number of highly important advantages which seem to me destined to convert the partisans of vaginal hysterectomy to the abdominal route and the American operation, and which will give to this operation a fixed and permanent place in gynecic surgery. Prominent among them is the opportunity to see the greater part of what you are doing, and equally to find and determine all of the pathology present, making accurate diagnosis possible, which, when determined, renders a complete operation possible; greater ease in overcoming unforeseen complications and in repairing injuries to the intestine, which are less likely, however, to occur in this operation. The danger of injury to the ureters is decidedly less, and, with all of the vessels under your eye, danger from hemorrhage is lessened. Last, but not least, the stitching of the cut borders of the broad ligament and cervical stump, and the covering of them by peritoneum, protect the intestine from subsequent adhesions and lessen the danger from volvulus.

THE TREATMENT OF INERTIA AND SUBINVOLUTION.[1]

BY

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I VENTURE to present this topic because in obstetrical practice it seems to have been neglected and too often left to the gynecologist for its detection after the puerperal period has passed and when pathological sequelæ have supervened. Almost every physician in general practice is an obstetrician, though not necessarily an obstetric specialist. It is an ordi-

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

nary custom in many localities to stipulate that two or three visits only shall be included in the obstetrical attendance. The result of this is that, in a very large proportion of cases, no attempt is made to determine whether involution has taken place, except when the woman observes something conspicuously wrong and sends for the doctor. In a theoretical sense it is true that labor is a physiological process, but, as a matter of fact, in practice it is very far from it. Blind reliance upon Nature's kindly offices leads often to dire disaster. The physician should realize that the opportunity for securing a firm contraction of the uterus is presented at every stage of the puerperium, and that it is his duty to secure this, even though his attendance continues over a period of twelve weeks. Briefly, we may recall the fact that at the termination of pregnancy the uterus has had its depth prolonged from the normal two and a half inches to six or more; that its weight, instead of being about a half-ounce, has increased to twenty or more ounces; that its capacity has been multiplied five hundred and nineteen times, but that the walls bounding this enlarged cavity are very much thinner than in the virgin state.

Retrogressive changes now are necessary for the normal restoration or involution of the uterus. Uterine muscles are to be removed by fatty degeneration, blood vessels and sinuses are to be contracted or destroyed, lymphatic spaces are still to be maintained, and the mucous membrane regenerated. Leopold has shown that this regeneration of the mucous membrane requires about ten weeks for its completion. The serous membrane and connective-tissue cells must also undergo this transformation. Involution is, therefore, a continuous process of decay and regeneration, of elimination and assimilation, of retrogression and progression.

Practically all the causes that interfere with the normal involution of the uterus may be included under two heads: first and principally, failure of uterine muscular contraction; secondly, and somewhat dependent upon the first, interference with the normal circulation of the blood.

When these obstructive conditions are exerted we have inertia and subinvolution—the first during the progress of labor, the latter after its completion. They are not, strictly speaking, pathological processes, but rather states of physiological arrest. They should be distinguished from a metritis or an endometritis, a retroflexion, a prolapsus, or a sepsis that may be invited by a patulous os or by open vessels due to a lacerated cervix.

Inertia and subinvolution are very generally due to conditions preceding normal pregnancy or that follow closely upon labor, and it is the object of this paper to demonstrate that for the most part they are preventable by treatment to be instituted during the puerperal period.

This is not the place to dwell upon the management of normal labor. It would be a very happy circumstance indeed were it possible for the surgeon to presume that a puerperal case should be attended under the same conditions as simple fever may be, but it has been demonstrated over and over that however beautiful the argument that labor is a normal process, and whatever strictures may be based upon what has often been styled meddlesome midwifery, the fact remains that the obstetrician who uses the same precaution as does the surgeon in the preparation of himself and patient and the regulation of their environment will have the best results for both. But there are conditions dependent upon civilization, that undermine the nerve forces of women, that cannot be regulated nor always foreseen. There are conditions in the life of a woman, beginning with childhood, that seem to develop the nervous system to such an exquisite degree that the evolution of the reproductive apparatus is interfered with. The relation between the two is not considered to any such degree as the circumstances demand, but no one can observe the life of a woman through girlhood and maturity without being impressed with this fact. It is of course in every case of faulty involution necessary to be sure that there is no retained placenta. It must be borne in mind that there may be present a fibroid, a lacerated cervix, valvular disease of the heart, and those rarer complications due to passive hyperemia dependent upon disease of other organs interfering with normal circulation.

The treatment of inertia is modified by the stages of labor. During the first stage there is no need, ordinarily, of active interference. Ergot is positively harmful to the mother in provoking tetanic spasms of pain, and to the fetus in disturbing the placental circulation. Rest by sleep is indicated more than anything else. Sometimes fifteen grains of chloral, repeated every quarter-hour, or one dose of thirty grains by rectum, may be particularly indicated. At times when worrisome and feeble pain is conspicuous, an eighth of morphia, hypodermatically, may be sufficient to give the patient a few hours to recuperate, when the labor will go on again in a normal course.

During the second stage, when inertia is present, if the cervix is dilated or dilatable, instrumental delivery may be the very best course of procedure. If, for any reason, that may not be advisable, the value of the slowly interrupted faradic current should not be overlooked. There need be no introduction of the electrode in the parturient canal; one pole, it matters not which, applied over the abdomen, the other at the lumbar spine, is equally effective. At this stage, if the primary current of quantity is distressful, the secondary one of tension may be substituted. The contraction will not then be marked by severe pain, but, on the other hand, the effect will be rather soothing. So far as my own observation goes, the pain complained of is due to the use of the current of quantity which generally distinguishes the little portable apparatus provided in the obstetrical outfit. Strychnia, given in doses of a twentieth or fortieth, repeated at intervals of a couple of hours if necessary, will bring into action the influence of the spinal motor centres. At this stage of labor strychnia will not only aid in increasing the strength of the uterine contractions, but it serves as an invaluable prophylactic against postpartum hemorrhage. Ergot at this stage is very rarely to be used, but if used should be guarded in its dosage so that tetanic contracture is avoided. I believe I have ofttimes happily changed the course of labor by the administration of strychnia as noted above, and five minims of the fluid extract of ergot at intervals of fifteen to thirty minutes, always withholding it when rhythmic contractions were secured.

It is particularly when the third stage of labor is reached that the most serious consequences of inertia are manifest; and any one who has observed a single case of postpartum hemorrhage, or perhaps has seen the life current ebb rapidly away before any means at hand could staunch the flow of blood, will understand how important is preventive treatment. I believe at this time the value of the faradic electrical current should be emphasized. It is my own rule to always have at hand a compact portable faradic apparatus with the coil of coarse wire, and apply the poles to the lumbar and abdominal region the moment danger threatens. In my experience I have never failed to secure a vigorous response to a current applied in this way. Theoretically, the bipolar intrauterine application is more active, but I have thus far never had occasion to apply it. The objection to introducing the pole into the cavity of the uterus is not of much weight, because, as a result of the

manipulation of the patient, the application of ice, the introduction of vinegar, and the various interferences for the checking of hemorrhage, it will be necessary to flush out the cavity with an antiseptic solution, and the simple introduction of the properly constructed bipolar electrode need not carry with it any great objection. The telescopic electrode should have no place in an aseptic equipment. It is uncleanly and in its cavernous tube lurks danger. The extreme value of the electrical current at such times has in my own neighborhood been so often recognized that scores and scores of times have I been sent for by my confrères, with the request to bring a battery to aid in controlling a case of uterine relaxation. By no means let it be understood that exclusive reliance is placed upon electricity at this time, but were I deprived of it I would feel that I was seriously crippled in respect to my armament. While the battery is being prepared, no time should be lost, but the placenta should be expressed and contraction secured by massage. At this time ergot has its precious place. It should never be given by the stomach. Again and again have I seen, after the situation was under control, the stomach eject the whiskey and ergot and whatever else may have been administered. The hypodermatic syringe should be at hand, precisely as we have our restoratives ready for instant use during the administration of an anesthetic. A valuable article in the obstetric outfit is the little hermetically sealed capsule of ergot for hypodermatic use. I wish at this point to emphasize the necessity of being sure that the uterine cavity is emptied not only of secundines but also of coagula. If the hand has been introduced, this makes necessary a final cleaning up with a 1 : 4000 sublimate douche. I believe that ordinarily the saline or plain water douche is not necessary following the use of the sublimate; the firm contraction and normal oozing that ought to follow will effectually guard the patient from any mercurial poisoning.

The woman who has been safely carried through her labor and is relieved from danger by hemorrhage is to be guarded with extreme care and ought to be kept under the frequent observation of the doctor during the following weeks of the puerperium. I have had women walk into my office many weeks after having aborted, complaining of hemorrhage and pelvic distress, who upon sounding have been marked by a uterine depth of four to five inches. One time. four months after a labor at full term, a woman appeared with the uterus measuring seven inches. During the period of convalescence, if there has been any difficulty about determining the presence

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of a cervical laceration, there should be little time lost in set-
tling that point. I have to again emphasize the value of the
electrical current during this period. It has been my practice
to show the nurse how to use the battery with the external
electrodes and make daily application of fifteen minutes' dura-
tion, using the slowest interrupted current. I have always
used the faradic battery. I have no doubt that the interrupted
galvanic current would be equally efficient—theoretically it
might be given the preference, or the two might be combined;
but my results have been very satisfactory thus far from the
use of faradism alone. It is to be noted that the cases I am
discussing are marked by faulty physiological action, but,
strictly speaking, are not pathological. There is no hyperpla-
sia. There is passive and less often active hyperemia. There
is stasis. The cases distinguished by chronicity promptly
respond to the influence of the bipolar intrauterine faradic
current. A uterus with a depth of five inches, four weeks after
abortion, after four applications during two weeks, I have ob-
served shrink down to a depth of three inches, hemorrhage
meanwhile being arrested and the woman continuing her
work. "The effects of the faradic current are mechanical
and may be accurately regulated; while analogous to ergot,
they are more prompt and energetic. The current is one of
constant breaking and closing. It produces a sort of inter-
stitial massage, heightening the activity of the circulation,
accelerating absorptive processes, and influencing favorably
the nutrition of the parts. By its direct excitation of the
smooth muscular fibres of the uterus we are enabled to com-
bat the stasis of the circulation which is the beginning of
uterine inflammation."[1] At this time, particularly after the
first week, the hot-water vaginal douche as outlined by Emmet
may be used with great advantage. The points always insisted
upon while using it are the elevation of the hips, by which to
secure the effects of gravity upon the circulation; the water at
a temperature of from 110° F. to 115° F.; the continued flow for
not less than fifteen minutes, used at least daily, sometimes
morning and night; and the continued horizontal position for
at least an hour afterward. Very much the same results may
be obtained by the introduction of boroglyceride tampons, in-
troduced daily or every other day, while the patient is in the
Sims posture. Where a well-trained nurse is in attendance

[1] Vide "Hare's System of Therapeutics," section by Rockwell, or A.
Lapthorn Smith's translation of Apostoli on "Metritis."

this may be left to her. The shrinking of the uterus that
follows upon this treatment is ofttimes wonderful. I find that
circumstances lead me at one time to prefer the hot water
and at another time the vaginal tampon. Much depends upon
our assistants; where the nurse is not very skilful and your
own time is limited, you may be safer in using the douche than
the tampon. The use of ergot at this time is of decided value.
The trouble to be overcome is lack of contraction in the non-
striated muscular fibres of the uterus. The most pronounced
action of ergot is just in this particular direction, so that it
would seem to be the ideal drug. Its combination with hydras-
tis and sometimes with indian hemp may be indicated. Nux
vomica or, preferably, strychnia in cases marked by faulty
innervation is of special value. In anemic cases iron is a strong
ally; cinchona or quinia are good adjuvants. Fordyce Barker's
preparation of nux, iron, and ergot is not a happy combination
pharmaceutically. Few women will be willing to repeat the
dose, and fewer stomachs still will be able to take care of it.
The treatment outlined by Tait has proved a very satisfactory
one, and, I believe, is based upon sound considerations. I refer
to the administration of ergot with citrate of potassium. The
combination of potassium with the vegetable acids, it should
be remembered, effects its elimination by the kidneys. Of all
the potash salts I believe the citrate is the most acceptable to
the stomach. It should be given in doses of from one-half to
one drachm three or four times a day, preferably administered
an hour before meal-time with a half-pint of water. There is
a special indication for its use in sthenic cases that present a
scanty flow of urine and very acid reaction, or with subjects
manifestly of a rheumatic diathesis. Contraction of the mus-
culature of the uterus and the elimination of retrograde prod-
ucts are the indications happily met by Tait's treatment.
The influence of constipation must not be forgotten. Saline
cathartics are particularly indicated in effecting depletion of
the pelvis through the veins, and an occasional cholagogue
may be necessary. There has been some doubt expressed as
to the influence of lactation upon involution. Early lessons
are impressive, and I may be biassed by the practice observed
twenty years ago when the old-time doctors insisted upon the
frequent nursing of the infant to effect uterine contraction,
notwithstanding the strenuous cries of the mother, whose
uterine pains were at once invoked; yet I believe, whatever may
be the theoretical consideration of the subject, that clinical

evidence is all in favor of the influence of lactation in effecting involution, and that every mother should be encouraged to nurse her baby in the hope that she will have a better getting-up in consequence. The unfortunate thing is, however, that here, as in the preceding stages of the puerperal period, the influence of asthenia again asserts itself, and lactation is too often missing.

I will conclude as I began, with the statement that the puerperal period is the precious time for the prevention of subinvolution; that this fact should rivet the attention of the obstetrician upon the uterus and its function of muscular contraction at all stages of labor and during convalescence. If this were more often considered and applied in practice the sequelæ of metritis, endometritis, retroflexion, and prolapsus would be far less frequent.

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POST-OPERATIVE ACUTE TOXIC HYPEREMIA AND INFLAMMATION OF THE KIDNEYS.[1]

BY

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THE varieties of nephritis and their etiology, pathology, symptomatology, etc., are matters of common record and are easy of access in current and classical literature Reference will be made to those forms only, of acute toxic hyperemia of the kidneys and even nephritis, which occur after surgical operations. Regarding this condition Hall [1] says: " Except septic infection, this is the gravest complication following a section with which we have to contend." Delafield [2] states that " it is not so well known that surgical operations on any part of the body are occasionally followed by suppression of urine, congestion of the kidneys, and death. We do not know that death in all these cases is caused by the congestion of the kidneys, but there can be no doubt that congestion of the kidneys is produced in this way." That the condition may exist with or without serious symptoms has been repeatedly demonstrated

[1] Read before the American Association of Obstetricians and Gynecologists at Indianapolis, September 19–21, 1899.

by many careful observers the world over, who habitually cause a systematic study of the urinary secretion and constituents to be made prior and subsequent to anesthetization and operation. I am convinced that it is of serious moment, as is every complication, however infrequent it may be, that places the life of a patient in jeopardy and rarely determines a fatal issue. Its causes and significance, therefore, are matters for most pertinent inquiry.

Etiology.—The frequency with which abnormal urinary constituents have been observed in post-operative cases with previously healthy kidneys points strongly to a causal relation between the operation and preparation therefor on the one hand and the kidney complication on the other. By recalling the generally recognized causes of nephritis it will be found that the most common are almost habitually present, viz.: exposure to cold and dampness, with chilling, not alone of the surface, but of the lungs as well; and the absorption, circulation, and elimination of toxic agents, *i.e.*, anesthetics, ptomaines, leucomaines, and other toxins. The effects of these causative agents will be considered *seriatim*. Predisposing conditions are probably more frequent than in a like number of healthy individuals.

In a carefully prepared paper read before this Association at its meeting held in Pittsburg in September, 1898, Dr. Rufus B. Hall,[1] of Cincinnati, discussed the results of exposure of the patient to dampness and draughts during and after operation. His remarks were thoroughly in accord with the views generally entertained with regard to the etiology of nephritis, and served to emphasize the importance of a grave error in surgical technique. To appreciate in a measure the effects of such exposure, varying in duration from a few minutes to more than an hour, it is only necessary for the surgeon to stand for a moment in a draught before removing his damp operating suit.

With reference to the irritating effects of ether and chloroform, and their products of elimination, upon diseased kidneys and other tissues with which they come in contact, opinion s positive ; regarding the degree and results of that irritation it is divided. That the tendency to irritation is not always in evidence is well known. That appropriate operation often relieves a hyperemia, and at times a true nephritis, is beyond question. The reason seems to be the removal of a cause more potent and persistent in its pernicious effects than the anesthetic.

Opinions of eminent men regarding the effects of ether and chloroform upon healthy kidneys are by no means uniform. In many instances they are widely divergent. Whether this difference results from the fact that some opinions are based upon scientific experiments with all conditions under direct control of the observer, while other opinions rest upon clinical evidence with many perturbing factors, is not clear.

Weir[9] concluded, from a study of 305 cases, "that etheriza- tion in the vast majority of cases in normal kidneys, and even in abnormal kidneys, brings about no detrimental effects; that when the evidences of abnormality present themselves they are transitory in character and not productive of harm; that elevation of temperature, which I had before thought would aggravate the work of the kidney and bring about, in conjunc- tion with an ether narcosis, abnormal excretions, does not appear to exercise any positive influence on this point. Yet the tabulated statement from which these conclusions are drawn shows "normal before, afterward abnormal, 31," and he says regarding them, " In nearly all of the cases marked 'abnormal afterward,' the albumin or casts disappeared or decreased within a few days after the etherization." He thus admits that an abnormal condition of the kidneys frequently exists, but has evidently been fortunate enough to see few if any un- favorable results therefrom.

He gives the following conclusions drawn by the authors named. Fenter, of Berne: "1. That ether has no perceptible effect upon the healthy kidneys of animals, which, moreover, are more susceptible than mankind to its influences. 2. That it is not dangerous in persons whose kidneys are slightly dis- eased. 3. That subsequent disturbances in the circulation of the kidneys, when met with, are very transitory and rapidly disappear." " Butler, in 500 cases of ether narcosis, found only once albuminuria where previously none had existed. Körte, in 600 cases that he collected, only found six instances where albumin presented itself where before the etherization none had been found, and he states very decidedly that ether does not aggravate a damaged kidney, but that chloroform does. . . . Garré[1] says very emphatically that he does not believe an at- tack of nephritis is at all likely to occur from etherization. Wunderlich concludes that in an already existing case albu- minura is frequently augmented by an ether narcosis; that this is twice as common in chloroform narcosis." The possibility of irritation is thus conceded, yet he adds, finally, that " ether

nephritis may be excluded from surgery." Keen and Da Costa [4] state that "Trieber and Roux did not find an instance of albuminuria in several hundred cases. The same authors give Selbach's [5] conclusion that "even prolonged etherization never produces nephritis."

On the other hand, Thompson and Kemp [6] conclude from experiments on animals that ether has a specific effect upon the kidneys, lowering their blood pressure out of proportion to that of the carotid, and that the quantity of urine decreases as narcosis becomes more pronounced; that albumin appears early and progresses with narcosis; that mixtures containing ether have an analogous but less marked effect; that chloroform narcosis causes albumin in less amount, but the circulatory discrepancy is not noticed. The very careful experiments made upon dogs by G. B. Wood [7] show that immediately and some time after ether narcosis the kidneys appear congested, and that microscopic examinations, confirmed by Guiteras, reveal a pronounced cloudy swelling of renal epithelium. They further show that repetition of anesthesia during several consecutive days gives rise to a true desquamative nephritis.

The following evidence, though in accord with these experiments, is subject to the fallacy that other factors than the anesthetic may have been present, and their influence, however slight it may be, must not be disregarded. Of 70 patients taking chloroform, Patein [8] found that 12 per cent had pre-existing albumin, 15 per cent albumin after anesthesia but before operation, 73 per cent after operation. Blake [9] says that "so-called ether nephritis was first described by American writers, and has never been found to any considerable degree except by Americans." He further says: "The writer has examined 50 cases, before and after ether (urine filtered and nitric acid test applied; the presence of a whitish precipitate or cloud at junction of acid and urine, visible against a dark background, was considered to be evidence of an appreciable and abnormal amount of albumin)." Of these 50 cases, 33 did not contain albumin before ether. In 25 cases that contained albumin after ether and none before, "2 presented a moderate amount (large trace), 4 a slight amount (trace), and 19 an extremely slight amount (slightest possible trace). No thorough examination was undertaken in regard to the duration of albuminuria. From occasional detached observations, it seemed, as would naturally be expected, to be of very short duration. Examination for casts was not made." Deaver [10] concludes,

after observations upon many cases and a systematic study of urine for ten days following operation upon 62 patients whose urine was previously normal, ether being the anesthetic used, that " consideration of these results leads us to the conclusion that ether has a very considerable irritating effect on the kidneys." He expresses the same view regarding chloroform. He states that Israel found abnormal urinary constituents in 33 out of 100 cases of chloroform narcosis. Hall [1] records 110 sections under ether, all kidneys normal previously; 33 had a trace of albumin the first day; 10 had partial or complete suppression from one to four days; 2 died in coma. Four hundred and sixty-five sections under chloroform, with previously healthy kidneys, showed 58 cases of albuminuria. No deaths from nephritis in this number. (He also gives cases with preexisting nephritis, but they are omitted because irrelevant.) He says: " We found the irritating effect of the ether so frequent that we abandoned it, and would not willingly go back to its use again." Carl Beck [11] found that the urine of 27 of 300 etherized patients with previously healthy kidneys contained albumin thereafter. Eisendrath [12] believes that both ether and chloroform are distinctly irritating to the healthy kidney; that the frequency with which renal elements appear in the urine after narcosis proves this fact; that abnormal constituents disappear within twenty-four hours; that chloroform has a much more pronounced effect than ether. Kelly [13] expresses the opinion that " acute nephritis rarely follows an operation except where there has been pre-existing disease."

The following brief summary is made from the records of the last thousand patients subjected to major operations in the Gynecological Department of Mercy Hospital. For the privilege of observing these cases during their convalescence I am most grateful to Dr. Werder, in whose service they occurred.

For many years it has been a custom to have repeated careful urinary analyses made prior to operation. Where casts or albumin were found and early operation was imperative, chloroform was given. Where operation could be postponed, attention was given to the kidneys and operation done when they became more nearly normal.

Some time ago there occurred within a few weeks two or three cases of marked hyperemia of the kidneys with pronounced symptoms. Since that time it has been customary to have urinary analyses made the day following operation, and as often thereafter as indicated, if evidence of irritation is

found. The urine of the first 261 reported cases was not systematically examined after operation. Only rare instances where symptoms suggested trouble were thus studied. Probably some of the earlier cases with symptoms were overlooked. Only 6 cases of this number, which were previously normal, are recorded as having urinary and systemic symptoms of kidney insufficiency; 5 responded promptly to treatment; 1 died. In the remaining 749 cases the average daily secretion for the first three days was about fourteen ounces. Urinary analyses were made before and after operation. Neither albumin nor casts were found before operation in 642 of this number. After operation 175 of them contained casts. A few less contained albumin also. About 135 of these cases presented no constitutional symptoms whatever. The quantity of urine was not below the post-operative average; albumin was in very small quantity, and the few hyaline and granular casts soon disappeared. Thirty others, the majority of these being operated upon for inflammatory conditions of the pelvic organs, presented pronounced evidences of systemic trouble. In the remaining 10 the symptoms were alarming. One died. In 2 fibroid cases and in a few others casts persisted for some weeks, without albumin or other symptoms, however.

The generally observed sudden marked diminution of urinary secretion occurring coincidently with anesthesia, and followed soon by the appearance of albumin and casts in the urine, without symptoms suggestive of other poisons, when considered in connection with the experiments upon animals previously referred to, leaves room for but little doubt that the anesthetic is capable of causing at least a hyperemia of the kidneys. When these abnormal constituents persist for weeks without especial symptoms, it looks as though an actual nephritis of low grade had been developed. If pronounced symptoms supervene at once, and if the symptoms persist, the possibility that the poisons which cause the symptoms may be irritating to the kidneys and actually intensify what was originally merely a hyperemia is not unlikely. It is this possibility and often this condition which, I think, renders the irritating effects of anesthetics a matter of no little consequence.

To attach importance to the last-named causative factor— *i.e.*, the absorption, circulation, and elimination of ptomaines, leucomaines, and other toxic agents—it will be necessary to show their existence, their irritating effects, that they are nor-

mally eliminated by the kidneys, and that poorly acting kidneys cause their retention with cumulative effects due to these specific poisons. I believe that such poisons are often present, far more often, in moderate degree, than we care to think or admit, the symptoms they cause usually being slight and considered as essential features of the healing process, just as "laudable pus" once was. An actual demonstration of their presence would be difficult. In its absence conclusions based upon that supposition must be subject to criticism and doubt.

That abundant opportunity for the generation of such poisons exists is shown by the following considerations. Familiar experiments by the best authorities have demonstrated beyond cavil the normal existence of organisms in the skin of surgeon and patient and that it is impossible to render the hands sterile. It is a matter of common observation that a good culture medium often awaits the introduction of more or less intensely virulent organisms. With or without culture medium, the healthy peritoneum or a fresh wound elsewhere is capable of destroying and disposing of a considerable number of pathogenic, even pyogenic, bacteria, as has been clearly shown by the experiments of Muscatello, Wegner, Grawitz, Pawlowski, Reichel,[14] Robb and Ghrisky,[15] and many others. An occasional stitch abscess or infected pedicle shows that this is not always effected without detriment. Fortunately an intelligent and conscientious use of rubber gloves, in conjunction with the strict observance of an aseptic technique, has materially lessened the number and frequency of post-operative sequelæ. But perfection has not yet been reached, and until that time comes we must expect occasional evidences of infection.

The frequency with which nephritic complications occur in the course of the acute infectious fevers is evidence of the irritating effects of their toxins. "Scarlet fever is said to be the mother of acute nephritis" (Whittaker[17]). Regarding the etiology of acute parenchymatous nephritis, Delafield[2] says: "Unquestionably all the infectious diseases are often complicated with inflammation of different parts of the body. The probable causes of these are the chemical poisons produced by the growth of the pathogenic bacteria belonging to each disease."

The effects of the specific poisons is so well known as to require no further comment, save that in a limited observation, embracing hardly more than 20 cases of diffuse septic peritonitis from all causes in which urinary analyses were made, I

do not recall one in which albumin and casts were not found. This statement has not been verified by reference to records, but is certainly not far from the truth. (It is needless to say that reference is not made to the cases of pelvic and other varieties of localized peritonitis that are of frequent occurrence and which often have associated evidences of kidney irritation.)

That these poisons are normally eliminated by the kidneys the following quotation from Vaughn and Novy [16] will show: " It is now a well-established fact that the urine of certain infectious diseases, as cholera (Bouchard) and septicemia (Feltz), etc., is far more poisonous than normal urine. That the poisons, basic or otherwise, which are generated within the body by the activity of bacteria can be excreted in the urine, is seen in the fact that immunity to the action of bacillus pyocyanus has been conferred on animals by previous injections of urine taken from animals inoculated with that bacillus (Bouchard) or with filtered cultures of the same (Charrin and Ruffer).

" Furthermore, the excretion of the tetanus and diphtheria poisons by the urine has been shown to take place. Thus, Brunner demonstrated the tetanus poison in the urine of experimental animals, bnt failed with the urine of the disease in man. Bruschettini, however, with the urine of a tetanus patient, produced tetanic symptoms in mice. In the urine from diphtheria patients Roux and Yersin demonstrated the presence of the diphtheritic poison by inducing paralysis in animals."

It is generally conceded that constitutional symptoms due to local foci of infection result from the elaboration, absorption, and circulation of specific poisons.[16] The evidences at my command of the cumulative effects of toxins are entirely of a clinical nature, and will be discussed when the symptoms of this condition are being considered.

Symptoms.—The symptoms of this affection of the kidneys are urinary and systemic.

The urinary secretion is markedly diminished after every major operation requiring an anesthetic, and especially so after operations involving the peritoneum. The average amount in 150 sections as given by Clark [19] was about 500 cubic centimetres a day for the first three days, during which it varies but little. The normal quantity is reached in ten days. This fairly represents the estimates of most observers. The specific gravity

is correspondingly high. In the vast majority of these cases nothing but the merest trace of albumin and a very few hyaline and pale granular casts are observed, casts being found more often than albumin. In the mildest type of this condition the abnormal urinary constituents appear within the first eighteen hours, are more pronounced for from twenty-four to thirty-six hours, and disappear within thirty-six to seventy-two hours. No other symptoms are noted. In this class it is likely that merely a hyperemia exists.

The symptoms appear to be more pronounced in about 16 per cent of the cases in which nephritic disturbance is found (about 3 per cent of the total number of post-operative cases by the writer). In these the subnormal urinary secretion continues; the abnormal constituents are in greater abundance and persist for some days—in a few instances some weeks—longer. The vomiting, which usually subsides within a few hours, returns at the end of twenty-four hours and varies with the impairment of function. It may be spontaneous or induced. Nausea is much more marked than in the primary vomiting. To this return of vomiting I have come to attach much significance, and believe that it is far more often a result of sluggish kidney action than is generally conceded. I think its persistence or return should invariably suggest and demand an immediate and careful urinary analysis.

In a few of the cases observed the symptoms were serious and quite unlike those found in the same grade of irritation in non-operative cases. They were strongly suggestive of beginning peritonitis, but I do not believe peritonitis existed. Vomiting persisted or returned. The pulse rapidly grew more frequent and less strong, reaching 120 to 140. The temperature was variable, usually elevated, sometimes reaching 101° to 102°, and not falling promptly to normal as after the usual section. The abdomen was more or less distended, but *not* tender. Peristalsis was sluggish. The urinary symptoms, as would be expected, soon became more pronounced than in the foregoing cases. The quantity at first is less than in health, but for the first few hours the normal amount after section did not in-crease, but progressively decreased. High color and specific gravity were noted. Albumin was present in most cases, absent in a few. Casts, at first only hyaline, within a few hours became numerous and all varieties were found. With this increase the symptoms grow more marked. In the favorable cases appro-priate remedies caused the skin, bowels, and kidneys to act

more freely, and the symptoms promptly subsided. In a very few cases—two in one thousand—the nephritis seems to have had a definite determining effect in causing death. The foregoing classification does not embrace cases in which nephritis merely complicates a diffuse septic peritonitis, to which latter condition it is in every way subordinate.

It will be noted from the symptoms detailed that edema was not once observed, that there was never a slow, full, bounding pulse, and that in no case were convulsions or coma present. Yet most writers on this subject attach too little significance to post-operative kidney lesions, presumably because of the absence of these classical symptoms of uremia. Thus Kelly [13] says: "Although acute congestion of the kidneys or acute nephritis are often assigned as the cause of death after surgical operations, I am unable to find a single record of such a case either in my clinical histories or autopsy records. In many instances a temporary increase in the amount of albumin and in the number of hyaline and granular casts, which have been present before operation, is noted, but in no instance has the patient shown signs of *uremia.*" He further asserts that "following all operations, especially the graver abdominal ones, there is a marked diminution in the amount of urine in twenty-four hours. It is, however, of little import and need occasion no alarm, so long as it does not persist *and there are no symptoms of uremia.*"

I think it will be generally conceded that the symptoms of nephritis are due to an impairment of the function of these important excretory organs and the consequent retention within the system of poisons that should be eliminated by them. The symptoms, then, must of necessity vary with the kind of poison retained. *In the affection under consideration the retained toxic agents do not cause uremia.* They cause a definite train of symptoms when absorbed in excessive quantities, and the same symptoms are seen when they are *retained* in excessive quantities. Observations upon many cases in which it was impossible to control oozing, and a pelvovaginal gauze drain was inserted to favor discharge without absorption of poisonous fluids, tend to confirm the view that symptoms of post-operative kidney lesions are due to sapremia with faulty action of the kidneys and an imperfect elimination of toxins. In several of the cases alluded to the gauze did not drain well and the symptoms were identical with those observed in the few cases with serious symptoms from post-opera-

tive nephritis. In the latter cases improvement followed im-
mediately upon increased urinary secretion, just as it did when
the gauze was removed and the cavity thoroughly washed
in the retention cases. In one class the supply was cut off
and absorption stopped; in the other an excessive quantity of
poison which had been retained in the system was speedily
eliminated. In either case failure to remove the cause of
trouble would have placed the patient's life in serious danger.

The opinion expressed above as to the cause of the symp-
toms of nephritis is not without precedent. Whittaker[17] says
of the nephritis occurring in the course of scarlet fever: "The
typical nephritis presents, as a rule, a picture very different
from that of ordinary albuminuria. It distinguishes itself by
the gravity of the nervous symptoms, by the extent of the
dropsies, as well as by the marked changes—presence of blood,
reduction in quantity, even to anuria, etc.—in the urine. It
distinguishes itself further by the fact that even the gravest
symptoms do not preclude recovery." This strongly suggests
that the symptoms are not due so much to the local lesions as
to the quality and quantity of the poison retained. Forsch-
heimer[18] states that "the peculiarity of the scarlatinal edema
is that it rapidly becomes anasarca. Leichtenstern believes
that the irritation of the scarlatinal poison takes place in the
lymphatics. Cohnheim believes that it is due, in common with
other forms of dropsy of the skin, to changes in the blood
vessels. The fact remains, as stated above, that this condition
is almost characteristic of scarlatina." Thompson[17] asserts
regarding diphtheritic nephritis that "it is exceptional for it
to occasion uremia or edema."

Though the analogy between post-operative nephritis and
that occurring in the course of the acute infectious fevers is
striking in many respects, some important differences exist—
viz.: 1. In the post-operative variety the system is well
cleansed of the ordinary effete substances by the preliminary
treatment, and hence the absence of the usual symptoms due
to them. 2. The heart and vessels have been depressed, and
hence the absence of high tension pulse, etc. 3. In the post-
operative variety the inflammation is not *caused* by the spe-
cific poison, but by the anesthetic, etc., and is intensified by
toxins, thus rendering it possible for a smaller quantity of these
agents to do more harm than in the specific fevers. 4. The
specific poisons produce their own effects and cause their own
series of symptoms in the respective conditions.

Treatment.—The treatment is prophylactic and curative.

The preliminary investigation of a case should always satisfy the surgeon that the kidneys are acting freely. Should any abnormality be detected in the quantity or composition of the urine, its causes should be determined and appropriate remedies used. It is quite as essential to have well-acting kidneys as well-acting bowels.

Exposure of the relaxed surface of the body at a time when the patient is wholly unable to resist its deleterious effects must be avoided. An extravagant and ill-directed use of water is to be condemned, for it saturates the coverings of the patient and evaporation causes chilling. It is the duty of the surgeon to scrutinize every detail of preparation.

The anesthetic should be administered by one thoroughly conversant with its *remote* as well as its immediate effects. His attention should be given to that alone, and the least possible quantity should be used.

The preparation for every operative procedure should be made with as much care as is taken by the bacteriologist in the isolation of organisms; for in the one case a life is at stake, in the other an isolated fact is to be settled. The proper use of sterile rubber gloves in conjunction with an otherwise aseptic technique is of great value.

The curative treatment is the same as for acute hyperemia or inflammation of the kidneys due to other causes, and is too well known to require comment. I cannot refrain, however, from commending most heartily the method popularized by Kelly, of using repeated enemata of normal salt solution for their decided prophylactic as well as curative effects.

In my opinion the significance of this condition depends largely upon associated complications. When it exists alone it is transient, *rarely* causes systemic symptoms, and requires no treatment. When sapremia coexists the nephritis is intensified and the symptoms, due to retained poisons, often assume a serious aspect. They are promptly relieved by restoration of kidney activity. If septic infection occurs the nephritis is intensified and the system is less able to cope with the invading bacteria. The prognosis is rendered more grave, but depends upon the seat of infection as well as the number and virulence of organisms.

Summary.—1. Post-operative acute hyperemia of the kidneys and nephritis are conditions that often exist, but seldom

give rise to serious symptoms or permanent lesion. They occasionally cause both.

2. They are due to predisposing causes plus exposure during and after operation, and toxic agents such as anesthetic, ptomaines, leucomaines, etc.

3. Anesthetics are undoubtedly irritating to diseased kidneys, but often the condition requiring operation is such as to render a moderate kidney lesion a secondary matter. A hyperemia of the kidneys, and even a nephritis, is often relieved by appropriate operation, notwithstanding the effects of the anesthetic.

4. Anesthetics are also irritating to healthy kidneys, but in the vast majority of cases this effect is only recognized by a systematic study of urine before and after operation.

5 The bacterial poisons met with after operation are in themselves usually irritating to the kidneys, and when their effects follow immediately upon the congestion resulting from the anesthetic, impaired function results. The toxins along with effete products are retained.

6. The retained poisons give rise to their own definite train of symptoms, which differ widely from those usually met with in the ordinary forms of nephritis, and hence the absence of edema, coma, convulsions, and other classical symptoms.

7. This condition is analogous (with important differences) to the nephritis of the acute infectious fevers, in which the symptoms of the original disease are decidedly intensified with but a slight kidney lesion.

8. The practical lessons to be drawn are: (*a*) To see that the emunctories are acting normally and to use every effort to promote their continued activity. (*b*) To prevent undue exposure. (*c*) To use the smallest possible quantity of anesthetic. (*d*) To be absolutely clean in technique, and (*e*) to recognize the condition at once and institute prompt and energetic treatment.

9. This condition has a significance of its own, because it occasionally causes serious symptoms, which may be averted or promptly relieved if it is recognized at once and appropriate treatment instituted.

In conclusion, I wish to express my thanks to Dr. J. D. Singley, pathologist to Mercy Hospital, for the privilege of reviewing his records, and to the resident pathologists whose efficient services contributed much to the comfort and safety of the patients in question.

524 PENN AVENUE.

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SUPRAPUBIC CYSTOTOMY FOR THE REMOVAL OF A LARGE ENCYSTED CALCULUS CONTAINING A HAIRPIN.[1]

BY

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MISS S., age 22, a weak-looking and badly nourished woman, much reduced in weight by long and severe suffering from vesical calculus of over one year's standing, came to my office May 24, 1897. Upon inquiry I found from her clinical history that fifteen months before she was troubled with a urethral irritation, and in endeavoring to relieve the intense itching with an ordinary steel wire hairpin, it slipped into the bladder and formed the nucleus for the development of the large phos-phatic calculus.

[1] Read before the American Association of Obstetricians and Gynecolo-gists, at Indianapolis, September 19–21, 1899.

The young woman, being bashful, preferred to suffer, which she says she did bravely, rather than inform her parents of the accident. Finally the time came when her nervous system began to break down from the long and continuous strain; her appetite failed; her weight decreased from one hundred and forty pounds to eighty-five pounds; her urination becoming more and more frequent, and at last dribbling from her as fast as formed—when she finally consulted her family physician, who recognized her true physical condition and malady, gave her an anesthetic, dilated her urethra, and made an attempt to crush the stone, and failed to do so on account of not being able to grasp the calculus.

On examination I found the urethra dilated to the size of a 36 French sound; urine, containing pus and mucus streaked with blood, trickling from her. The surrounding soft parts were congested, swollen, and eroded from the discharge, making an internal examination very difficult. Upon introducing my finger into the bladder I came in contact with the calculus extending into the trigone, and on gently trying to separate the walls of the bladder from the calculus I found it was impossible, as the stone was encysted, and to perform lithotrity under these unfavorable conditions would jeopardize the life of my patient. I sent her to the West Penn Hospital, and ordered her to be prepared for a suprapubic cystotomy.

On May 25 ether was administered by Dr. Keller. I was assisted by Dr. Sanes, senior resident of the West Penn Hospital. The operation was witnessed by my friends Drs. J. W. McFarlane, C. B. King, and R. G. Herron, staff surgeons to the West Penn Hospital. I commenced by attempting to inject a weak solution of boracic acid in water into the bladder, but failed, as the bladder would only hold half an ounce. I then introduced the pear-shaped india-rubber bag into the rectum, and distended with twelve ounces of water. The position of the bladder was now very slightly visible above the pubes and could be defined by palpation and percussion. I made an incision of the skin and fatty tissue from the symphysis pubis upward about six inches long, dissecting in the manner directed down to the linea alba. I notched it and incised on a director about five inches. I then divided its connection with the symphysis pubis on each side laterally for about half an inch, as well as the attachments of the recti muscles, and separated these muscles with my finger, and continued to divide the transversalis fascia with my finger nail down to the bladder, without any hemorrhage worth noticing.

The hard bladder could be felt by pushing down and back of the symphysis pubis. Inserting a small curved hook, holding this in the left hand, I resumed the scalpel for the purpose of puncturing the bladder sufficiently to allow the index finger to enter the bladder, which came in contact with the hard calculus. In attempting to make this opening larger the peritoneal cavity was opened. Gauze sponge was used to protect the cavity, and the bladder was divided nearly into halves (antero-posterior) in order to encircle the calculus. The bladder walls were then stripped off the calculus; the mucosa dipping down into the sulci of the calculus making the operation very slow and tedious, until finally enough room was made for the introduction of a large lithotomy forceps, and after a few attempts I was able to crush the stone and remove it piecemeal. From the conditions revealed I found that my first impression and diagnosis of the calculus was correct: the stone was completely encysted. The wall of the bladder had lost its tone and become very friable; any slight traction made on its walls would tear out the piece; and had I attempted to force my way into the bladder from below to crush the stone, I certainly would have ruptured the bladder, infected the peritoneal cavity, and lost my patient.

The bladder was washed out with Thiersch's solution to carry off the fragments and broken-down filaments of the mucosa. A portion of the omentum was removed which had come in contact with the infected bladder during the operation. The fragments of stone and hairpin removed weighed a little over eight ounces, and the concretion was phosphatic.

There was no hemorrhage worth mentioning, and no treatment was required in regard to it. The rectal bag was removed. Five sutures were introduced into the upper portion of the incision, in order to close the peritoneal cavity. The remainder of the incision was allowed to heal by granulation. The patient was placed in bed on her back. The urine drained off freely from the wound and the urethra. She stood the operation very badly. Saline injections were given freely during the operation.

Her condition the next few days was very critical; pulse ranged from 110 to 135, temperature from 103° to 104.5°. The bladder was washed out every eight hours with either Thiersch or permanganate solution under the supervision of Dr. Sanes. Finally the pus discharge began to diminish, patient began to eat, and her recovery was assured. Four weeks after the

operation the pulse and temperature were nearly normal.   The tone of the bladder was rapidly being restored to its former con- dition, the wound nearly healed, and almost all the urine being passed by the urethra.   She left the hospital on July 6 in very good condition, although weak, but with a good appetite and feeling well.   I saw her ten months after the operation; she then weighed one hundred and fifty pounds, did not have to get up at night to void urine, her bladder had perfectly regained its former tone, and she is sound again in all her physical conditions.

PARK BUILDING.

ABDOMINAL VERSUS VAGINAL SECTION IN THE TREATMENT OF PELVIC DISEASE.[1]

BY

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ALL that pelvic surgery is must be accredited to the abdom- inal incision, and it is a monument to the boldness of those advanced men who first dared to invade the sacred cavity of the peritoneum.   For many years following the brilliant pioneer work of McDowell there was no pelvic surgery other than the ligation of pedicles of large tumors, the smaller growths being entirely neglected owing to the incomplete methods of diagnosis at that time.   When the abdomen was opened many supposed tumors were found to be merely cases of abdominal dropsy, and many growths diagnosed as ovarian cysts were shown to be fibroid tumors of the uterus or other solid neoplasms from which even bold operators shrank, so fearful was the mortality when interference was attempted.

Frequently these incomplete operations were regarded as surgical mistakes; but the great injustice of the assumption soon developed the aggressive spirit in the self-respecting sur- geon, and the " working diagnosis " and the " exploratory incision " were promptly accorded a position of recognized re- spectability.   With the advent of antiseptic and especially of aseptic methods in surgery the mortality of the exploratory incision became almost *nil* and the number of such operations was enormously increased, and it is to the conscientious inves- tigations which were only possible through the exploratory

[1] Read before the American Association of Obstetricians and Gynecolo- gists, at Indianapolis, September 19-21, 1899.

incision that we owe our *fin-de-siècle* knowledge of pelvic pathology.

The technique of pelvic surgery through the abdominal incision has in recent years been brought to a very high state of approximate perfection, and yet there remain certain objectionable features which occasionally complicate cases and lead to disastrous results. The objections which one may justly charge are:

1. The impossibility of proper drainage.

2. The exposure of large peritoneal surfaces to the danger of infection in breaking up old adhesions in the effort to reach the pelvic floor, and in dragging septic materials back up through the cavity.

3. The occasional occurrence of hernia.

4. The scar.

A few words in discussion of these four points will be offered later in considering some other facts. The operation known as vaginal hysterectomy, as perfected by A. Martin, was indeed a bold departure and a great triumph of individual courage and rare skill, comparable in vaginal surgery to the achievements of McDowell in the abdomen. At first there were few imitators. The difficulties and risk which it entailed seemed formidable, but the great practical value and wide application of the technique involved soon won for it full recognition and the unqualified indorsement of the profession throughout the world. Equipped with a greatly increased facility of vaginal maneuvring, the result of much practice in the performance of hysterectomy for recognized uterine disease, men have recently attempted to effect through vaginal celiotomy, more or less radical, all that has been heretofore accomplished by the abdominal route, excepting only the removal of large tumors and certain visceral lesions. It is maintained by advocates of the procedure that all the objections which obtain as to the suprapubic method are entirely overcome in the vaginal operation; and as proof of this position Pryor reports the completion of his *first one hundred operations* without a death. The list includes : '' old tubal, ovarian, and peritoneal lesions,'' tubes distorted and adherent after many attacks of peritonitis, *sixteen times ;* pyosalpinx or ovarian abscess, the lesion being in *all cases bilateral,* *fifty-four times ;* diffuse suppuration, *nine times ;* pelvic bands, sinuses, or other lesions due to laparatomy, *eight times;* ectopic gestation with pus foci, the sacs sometimes ruptured

and sometimes not ruptured, *thirteen times*. In the reflected light of such a brilliant showing as the above, it is not surprising that certain enthusiastic surgeons should take the position that laparatomy for pelvic disease should be practically abandoned and only resorted to in case of certain emergencies or unforeseen complications.

It is no doubt unavoidable and in some degree conducive to progress that the elated promulgators of new theories should emphasize their positions by extravagant claims and proceed to advance facts in support of their boldest statements.   In this effort the possibilities are thoroughly exploited, and, in turn, whatsoever is radically different from the accepted attitude of the profession is sure to be earnestly contested, and eventually all of the facts relating to the controversy are made to stand out clearly and a just appreciation of their true value obtains.   I do not believe that operators will display unseemly haste to abandon an old and tried, even if an imperfect, method for a procedure which bears the stamp of novelty and whose merits are only in some degree established, although its advocates be eminently respectable and promise much.

In an effort to reach an unbiassed conclusion as to the relative merits of the two procedures as applied to similar cases, and also, if possible, to evolve some rule to guide the operator in making a choice of what is best for his patient, I will present such facts bearing on the case as I can command, many of which are from my own experience, and shall aim to be guided solely by the logic of such facts.   The evidence of eminent advocates of either method is of the utmost value and certainly commands our respectful consideration, but shall not be allowed unchallenged to contradict personal experience.   I cannot conceive that the technique of vaginal extirpation of adherent tubes and ovaries can ever be made as simple and safe as that of the suprapubic operation.   It is certainly not justifiable to separate strong intestinal, and especially appendical, adhesions in the dark; nor is it justifiable to greatly risk wounding such viscera, even under ocular inspection, unless one is prepared to make immediate repair of such damage, which is utterly impossible when working through the vagina; nor will it do to say that such injuries are rare, and when they do occur we can open the abdomen in the usual way and quickly reach the wounded viscera.   Naturally such injuries are rare, but when they do occur, if in the operation by abdominal section, we are immediately aware of such occurrence and at

once make the necessary repairs with the minimum of exposure; while if the same damage be done through the vaginal cut, we have to abandon an incomplete operation, begin anew by abdominal section, drag the perforated and leaking gut up through the cavity at considerable risk of infection, and the patient has been subjected to *two* instead of *one* chance of shock and to a duplicate chance of infection.

In one of my cases a left pus sac had discharged into the rectum and there was present a large, fluctuating mass in the right cul-de-sac. This might have appeared an eminently appropriate case for attack by the vaginal method, but the procedure had not at that time been introduced and therefore there was no temptation to deviate from my habit of abdominal section; and indeed it was very fortunate, too, that such was the case, as I found not only a very large tube filled with pus, but also the appendix distended with pus and glued tightly around the cecum, and so large a rent was made in the attempt at separation that a resection of the cecum was necessitated by simple end-to-end anastomosis. Recovery in this case resulted after severe shock, and I am quite certain I should have had a fatal outcome had I first made the attempt to operate by vaginal section, which I should have been compelled to abandon; or, not comprehending the complicated pathology of the case, I would have removed the pus tube and finished my operation in fancied security, only to suffer the chagrin of witnessing my patient succumb to an early rupture of the rotten appendix. Pryor, the most enthusiastic of the advocates of "vaginal ablation," in replying to the question, "Can you tell through the vagina whether or not the appendix should be removed?" admits that unless such complication can be foreseen his position is untenable, and then replies that "it is time enough to remove the appendix when it produces symptoms requiring it."

It is perfectly clear that on this point Pryor's usually comprehensive grasp of cold facts was relaxed and sophistry is made to cover a fatally weak point in his argument; for it is incontrovertible that in the case I have just related no sane man would for a moment think of postponing the removal of such an appendix longer than the time necessary for diagnosis, which under the "expectant plan" would have been probably too late. It would have been quite impossible to have made a diagnosis of the conditions found in this case in any other way than by abdominal section; and, although it is barely possible that the pus tube might have been moved through the vagina, a very grave condition would have been left unrecognized and

threatening death, as the gut wall was gangrenous in appearance and would have soon broken down, even if it and also the appendix had escaped injury in tearing away the pus tube. Certainly this one case is food for much thought in considering what is best.

In another case a knuckle of gut was caught down against the left broad ligament and formed a horseshoe side to an abscess which began in the left tube and ovary; here again a resection was necessary, and I cannot believe but that in the hands of any operator, however skilled, nothing but disaster could have promptly attended an attempt to meet the indications by vaginal section.

Since beginning this paper I have encountered a case which emphasizes the dangers of the vaginal method as applied to a large class of cases. Three days ago I operated upon a young woman who had suffered intensely with right pelvic pain; nothing save tenderness was revealed by digital touch, but when the abdomen was opened the right ovary was found densely adherent to the cecum and had to be dissected away by scissors, and even then the muscular coat of the bowel was bared and I was compelled to close in a small weak point with catgut. I am sure it could not have been accomplished by any other method, nor would it have been good surgery, even if it had been possible (which it was not), to draw the gut down into the vagina (which cannot be considered aseptic) for repair.

It occasionally happens that the bladder is opened into or that a ureter is torn in the vaginal operation. Now, if this were the universally accepted operation, one can scarcely conceive of the vast amount of damage done and suffering entailed in the early efforts of ambitious men before they acquire the skill which is accredited to the expert operator. Incidentally it might be wise to advocate this method in the belief that its very difficulties would discourage a large per cent of slipshod surgeons from persevering in their discreditable work.

An objection to vaginal celiotomy which has not as yet been materially modified is that the wound cannot be antiseptically dressed; the pelvic floor must be left open and the viscera constantly exposed to the direct contact of whatever infectious material may chance to be present. With care the danger is minimized, but in a considerable degree it is ever present.

In the removal of pus tubes through the vagina the only mechanical safety is found in " vaginal ablation," as described by Pryor, or in some similar method which likewise involves the removal of the uterus. To my mind this one statement is

quite sufficient to condemn the vaginal operation, unless a distinctly lower death rate can be shown than is charged to the same quality of cases operated by abdominal section.

Conservative surgery is not on the defensive and can never be forced to that false position.   Assertions do not make facts, and the physiologists are not likely to concede that because the tubes and ovaries are functionally destroyed and therefore to be removed, the uterus may also just as well go.   The fact that a woman is better off with a uterus than without one is so universally conceded, and the reasons for it, moral, mental, and physical, are so well established, that I shall not open this line of evidence in detail.

Another serious objection to vaginal ablation obtains in the subsequent history of the individual so operated.   In all cases there is an appreciable shortening of the vagina from the contraction of the cicatrix in the vault.   Now, it is very frequently the case that this shortening is very pronounced, and in many cases it amounts practically to an obliteration of the canal so far as practical utility is concerned, and on this account the marriage state becomes intolerable and the last state of that woman is worse than the first.

In the correction of retrodisplacements the vaginal operation of Dührssen and that of Mackenrodt, Martin's assistant, have certainly distinct merit, but the results are not uniformly ideal.   I was in Berlin at the time (July, 1892) Dührssen made his first report of 125 cases, of which he claimed 90 per cent permanently cured; 8 of them had been subsequently confined and the malposition did not recur.   Mackenrodt and Martin about the same time developed a similar operation, differing somewhat in technique, for which they claim superior results. I saw these men do their chosen operations repeatedly, and probably my report was the first detailed description of these operations published in America.[1]   I have adopted these methods a number of times, and the results have been fair in most cases and quite satisfactory in some ; the greatest objection is that, fixing a comparatively heavy body like the uterus to an insecure anchorage in the vaginal wall, the displacement is very likely to be reproduced, the vagina being dragged downward and backward.   I believe the suprapubic operation as modified by Howard Kelly, in which the parietal peritoneum is alone made to support the organ, is distinctly the most reliable to overcome persistent retrodisplacements of the uterus, and so far it seems free from any serious objections.

[1]Indiana Medical Journal, August, 1892.

In order to arrive at a satisfactory conclusion as to the relative merits of the abdominal and the vaginal methods, let us for a moment contrast their claims and defects. In the former we do not get the proper drainage; this is only an occasional misfortune, as the vast majority of patients are distinctly safer without it. In the vaginal operation we also require drainage in only a *small per cent* of cases, but *must tolerate* it in all cases, certainly increasing the danger in some degree. Therefore the abdominal operation has, in my opinion, the best of the argument on the subject of drainage.

As to hernia, it occurs in such a small per cent of cases as to remove it from serious consideration when contrasting it with an operation so radical as the routine removal of the uterus simply to make the field of operation accessible.

As to conveying sepsis in efforts to reach diseased structures and in dragging them up through the cavity, this is certainly offset in the vaginal operation by entering the pelvic cavity through a non-sterile route—the vagina—and by dragging diseased structures from their points of adhesion in the dark.

It will be remembered that in Pryor's description of vaginal ablation the uterus, together with both ovaries and tubes, is removed; in his report of fifty-four consecutive cases of pyosalpinx he had the rare experience that they were in every instance bilateral. Of course that fact was in some degree an atonement for the loss of the uterus; but as he must expect frequently to encounter the disease on one side, the other side remaining healthy, he must either admit that there is here a fatally weak point in his system, or else consistently insist on his radical routine and remove a healthy tube, ovary, and uterus in order to render easy the task of removing a single diseased tube and ovary. The only argument which can possibly convince conservative men of the propriety of such procedures is their *constant* repetition without mortality.

The "abdominal scar" will, of course, never be alluded to seriously by an intelligent man; the contracting cicatrix in the vault of the partially extinct vagina does not stare at one quite so boldly; but if the abdominal scar is liable to excite in the mind of the young bridegroom the suspicion that the bride has had her ovaries removed (which objection to the abdominal incision was recently offered), who shall describe his state of mind on discovering that ovaries, uterus, and vagina are gone?

Of course in bulging pelvic abscesses we must incise the vaginal vault, and occasionally we can more safely handle ruptured tubal pregnancy by the same method. I saved one

such case in this manner, making a free incision and packing with gauze, the patient being in collapse at the time.   Shock is certainly as frequent and pronounced in vaginal as in abdominal section, especially so when the uterus is to be removed.

In the matter of statistics I have very little to say.   I am convinced that if an operator will give every case a chance, not turning the bad ones over to some friend (?), he is bound to have fatalities in his practice, regardless of what method he shall follow; the per cent may be three, six, or eight, and he need not blush to admit even the highest rate in some especially difficult lists which fate occasionally brings him.   I do not presume to offer any explanation for the flattering statistics offered by Pryor, whom I know personally and respect highly, nor what reason he had for rejecting individuals, nor how it occurred that his friends kept the desperate ones out of his hands; but personally I find it impossible to believe that any man can take one hundred consecutive cases, *without discrimination*, and remove tubes, ovaries, and uterus without a death.

On the whole I am convinced that if we can devise some practical method of drainage in those cases where it is indicated, we may choose between the vaginal and abdominal methods of *hysterectomy* without having to weigh any very serious questions, but that we are in no way justified in resorting to the so-called " vaginal ablation " as a method of choice in dealing with pelvic disease.

THE WILLOUGHBY BUILDING,
224 North Meridian street.

THE NOSE A FACTOR IN POST-OPERATIVE DISEASE.[1]

REPORT OF A CELIOTOMY FOLLOWED BY MALIGNANT SEPTICEMIA OF NASAL ORIGIN; FURTHER OBSERVATIONS; REMARKS.

BY

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Mrs. McC. was referred to me by Dr. Will F. Green, of Shelbyville, in June, 1896, for treatment of a subinvolution and retroflexion of the uterus.   Patient was a woman of strong

[1] Thesis presented before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

build, age 32, mother of one child. She suffered sacral and occipital pains, dysmenorrhea, and great physical and psychical depression. No conception since the childbirth eight years ago.

My examination of the pelvic organs confirmed the diagnosis of the family physician. The womb was found impacted, though reducible. There was no evidence of inflammatory complication. The ovaries were prolapsed, tender, and showed small cystic enlargement. I decided to curette the womb then by celiotomy, to incise the small cysts of the ovaries and ventrofixate the uterus. The patient was under my observation three days before the operation. The temperature during this time varied between 98° and 100.2°, and the pulse between 82 and 100. These deviations from the normal were not explained after a searching local and general examination. In the absence of a better explanation they were ascribed to psychical excitement.

Operation at my sanitarium on June 27, 1896, under chloroform. The diagnosis was confirmed. No evidence of inflammation in the pelvis, obsolete or active, was found. An afebrile, uneventful recovery was anticipated.

The course of the case subsequent to the operation was interesting from the start. The temperature at midnight of the day of the operation was 101.2°, pulse 98. Patient restless and complaining of drawing sacral pains. Abdomen flat, not tender. Bilious vomiting and retching. There was a profuse nasal and pharyngeal secretion, but no more than is frequently present after narcosis; it was attended with hoarseness and some cough. Feeding by mouth was unsatisfactory, and rectal alimentation was kept up from the beginning. The temperature continued febrile, being 103° much of the time, and reaching 104° on the sixth and seventh days. The pulse commonly varied between 88 and 100 and was fair; latterly it rose in spurts to 140 and more beats, and at such times showed irregularity and bad quality. Internal antiseptics, antipyretics, and stimulants were employed, seemingly without effect. The skin soon became dry and showed a septic, yellow color. Sensorium was free. At times of the high fever and pulse the patient developed euphoria. The restlessness of the patient and the lack of solicitude about herself were striking features of the condition. The rectal discharges marked no departure from the normal. The abdominal wound and the pelvic viscera were repeatedly examined, without finding anything wrong. The abdomen remained free from tenderness. Bloating was

transiently present in moderate degree; it yielded readily to the rectal tube.

The unsuccessful search for the cause of the septicemia was distracting. I felt yet I must associate it with the operation. The uterine cavity was swabbed with twenty-five per cent carbolic acid, though there was no condition present to indicate such procedure. The sutures fixing the uterus to the abdominal wall were released the third day in the faint hope that this might relieve nervous tension. On the night of the fourth day the abdomen was opened under chloroform, but nothing abnormal was found. The uterus was again ventrofixated. Subsequently the sutures holding the uterus were again removed. Meanwhile the patient's general condition had grown critical. She was weak and helpless to the extreme, and the end seemed not far. The secretion from the throat and nose continued. It was observed that it had increased since the second narcosis, and that it had grown somewhat fibrous and purulent in character. Hoarseness and aphonia had gradually developed.

At this stage the case recalled to my mind a short and wilting septicemia which I had suffered when I had had a spur removed from my nose some time previously. At the time, when I mentioned my experience to the nasal operator, he disclaimed septicemia of such origin. To me, however, the nasal operation and the following septicemia seemed intimately associated. I considered the possibility of a nasal origin of the septicemia in my patient. The nose and throat were vigorously cleansed with peroxide of hydrogen. Before this gargles of borated water and bicarbonate of sodium solution had been used. The use of the peroxide of hydrogen was followed by early marked improvement. The temperature was taken hourly for two days. At this time—the seventh day after the operation—it registered 104°. After the second nasal douching it fell to 102°, and soon it fell to normal. It rose a few times, in spurts only, lasting an hour or two. After the tenth day the temperature continued normal. A bacteriological examination of the nasal and laryngeal secretion unfortunately was not made.

Further inquiry into the history of this patient ascertained that she had had several attacks of acute nasal and laryngeal catarrh. Aphonia, stridulous cough, great lassitude and depression followed by slow recovery, were the characteristic features of these attacks. The family physician had designated the attacks as croup. The attack observed by me undoubtedly

was of like character, though possibly in degree was more severe than any former attack.

After leaving me the patient had her nose treated by a nasal specialist. Following an operation on the nose the patient suffered another severe though aborted attack of septicemia, during which she lost her voice for the while. Since then the nose has been cured and no more attacks have occurred.

It is remarkable in this connection that text books on the nose have nothing to say on febrile temperatures, sepsis, infection, etc., either as pertaining to the sequelæ of nasal operations or to the ordinary non-traumatic diseases. I say this after perusal of the last edition each of F. H. Bosworth and of Fletcher Ingals. Rhinologists to whom I have addressed myself tell me that other special works are equally silent on these matters. From *a priori* reasoning there appears no ground why septicemia should not attend upon nasal disease and nasal operations. That the grave septicemia in my case was of nasal origin seems to me incontrovertible; also, that the neglect of the nasal treatment would have entailed the death of the patient.

The nasal cavity naturally, and even more by the deformities its diseases develop, has nooks and corners, crevices and ledges, which arrest the microbes of the inhaled air and retain the nasal secretions. Here are given *ne plus ultra* conditions for bacterial propagation. Toxic absorption and infection must and do occur. The malaise, mental dulness, glandular stagnation, sallow septic color, so invariably present in almost every case of nasal catarrh, are rationally accounted for by the assumption of septicemia.

The lesson of my case for me has been to look for nasal complications in all cases. In the three years that have passed I have found noteworthy nasal complications in about 30 per cent of all cases. Persistent vomiting after operation can be owing to it. The nasal disease acts in a twofold way to produce this—namely, mechanically, by causing hawking and spitting and ultimately disquieting the stomach; and chemically, through the agency of the nasal toxins. Headache, restlessness when awake or asleep, insomnia, anorexia and indigestion, coated tongue, were frequently relieved or mitigated by nasal treatment. Slight elevations of temperature, otherwise unaccountable, were at times controlled by nasal treatment. I have observed only one other case of grave nasal

septicemia such as the case reported.   I must accept that such cases are rare.   How much my treatment forestalled grave symptoms in other cases I may not know.

The many times that I found nasal disease complicating a recovery from an operation or complicating other diseases have led me to ask myself what conditions there were that especially favored nasal pathogeny in my cases.   I would enumerate as such conditions, namely, first, the acute transition, commonly, from an active life to passivity, and from an intermittent erect and prone position to one of continuous recumbency; and, second, the devitalizing effects of the chloroform upon the tissues, local and general.

The acute change from an active life to one of passivity, while commonly easily met by the system, yet entails perceptible difficulties in those weakened by disease.   The powers of accommodation, anyway, are variable in different individuals. This. though a minor factor, deserves mentioning, because it is superadded to the derangement of circulation resulting from prolonged recumbency.   Continuous recumbency involves great changes in the circulation, or, more specifically, changes in the hydrostatic conditions of the body.   We note that the subject of nasal disease awakens from dreamful and disquieted sleep with a dull mind, a foul tongue and anorexia, and a lethargic body.   These, as the morning passes, are steadily dispersed.   During recumbency there is increased flow of blood to the head, which, owing to the nasal occlusion, has deficient return flow.   In turn this hyperemia entails an interference with nasal and pharyngeal glandular function.   The hyperemia and glandular stagnation are measurably relieved by the upright position.   During continuous recumbency, however, the consequent morbid changes are increased in degree and likely involve bacterial propagation.   This latter is probably minimized when the recumbency is of the ordinary short duration.   The subject of nasal catarrh under ordinary conditions holds the prone position only one-third of the day.   Yet this time suffices to produce evidence of congestion and septicemia. This being true, the deleterious influence of prolonged recumbency must be expected to be proportionately greater.   The natural powers undoubtedly in many cases mitigate and overcome these evils or establish a tolerance of them.   But at all times such conditions have pathologic significance, varying from a slight transient malaise to the malignant septicemia which was manifested in my case.

Secondly, there is the local and general effect of a surgical narcosis to increase the liability to nasal developments. It is generally accepted that chloroform and ether devitalize the tissue cells with which they come in contact. Then, too, the general circulation and the nervous system suffer disturbances and depression. These effects favor saprophytic and patho-genic bacterial processes within the nose and throat, and, indeed, the body. In the case related the narcosis was de-cidedly helpful in promoting bacterial activity. It may be assumed that the special bacterium involved was domiciled in the nose and its vicinal cavities. There was a distinct increase of the nasal and throat symptoms immediately following each narcosis.

The physical conditions pertaining to a recumbency the re-sult of internal disease differ only in degree from those en-tailed by surgical procedures. To this extent my observation and deductions hold good and apply to internal cases as well. Indeed, in looking back upon my experience in general prac-tice, I discover quite a number of instances where the nose might justly be accused of complicity in the etiology and the gravity of the disease.

In conclusion, it is difficult to say to what extent it is justi-fiable to suspect nasal septicemia as a cause of death in in-stances where the postmortem finding has failed to reveal adequate cause of death. It is certain that the nose has here-tofore been disregarded, except, perhaps, in those cases where diphtheria or erysipelas was recognized before death occurred. When once the nose is closely scrutinized for evidence of dis-ease, it may be it will be connected with otherwise unex-plained deaths. Had my case died without there having been previously detected the nasal disease, the case would have been added to the humiliating list of postmortems where the find-ing falls short of assigning an adequate cause of death. Then, probably, we would have been driven to say that the septic character of the infection was such that the smallest quantity of its toxin had extinguished life even before a demonstrable lesion could develop.

Recently the following case came under my observation, which may fitly be added here. A young man of fine physique and apparently resplendent health was suddenly stricken with appendicitis. The operation, undertaken for its relief within thirty hours after the first appearance of acute symptoms, was without complication, and an uneventful re-

covery seemed promised. The wound and the abdomen at no time showed evidence of trouble. Thirty-six hours later symptoms of an impending meningitis developed, and death from this cause supervened in twenty-four hours more. The patient, it was ascertained, had suffered daily recurring nasal occlusion with " full " head and painful eyes in the preceding six or eight weeks. Relief had come each day with a nasal hemorrhage. Slight hemorrhage and occlusion of the nose were observed on the second day after the operation, but were not promptly acted upon. The nasal process had evidently existed a long time in dangerous proximity to the cerebral meninges. It may be accepted that the effect of the narcosis and the prolonged recumbency sufficed to overcome the barriers which had heretofore successfully withstood the impending cerebral invasion.

316 East Michigan street.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

Proceedings of the Twelfth Annual Meeting, held at Indianapolis, Indiana, September 19, 20, and 21, 1899.

The President, Edward J. Ill, M.D., *of Newark, in the Chair.*

First Day—Morning Session.

After a brief executive session, addresses of welcome, etc., the reading of papers was begun.

Dr. James F. Baldwin, of Columbus, Ohio, read a paper entitled

THREE RARE CASES OF KIDNEY CYSTS.[1]

Dr. James F. W. Ross, of Toronto.—I have been much interested in this paper, and I wish to call attention to one point in connection with the diagnosis of cystic tumors of the kidney, such as the author spoke of, and I do not know that there is any exception to the rule, and it is this: Given a tumor that is unilocular by fluctuation, but apparently multilocular on account of the striæ found across it, that tumor is always one of the kidney and not of the ovary.

One other point relative to the treatment of the ureter. If

[1] See original article, p. 643.

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the ureter is stripped down to a considerable distance and its end tied with catgut, it can be left in the course of a nephrectomy, and I do not think it is necessary to follow the ureter down to the bladder.

A most important question in these cases of paranephric cysts is that they are congenital oftentimes. I recall a case of cyst of the kidney of the kind mentioned, in a young girl. Fortunately I did not do a nephrectomy. At the end of several weeks a cyst showed itself in the other kidney and I also opened it. I drew out the cyst wall, cut off a portion of it, left a drainage tube in for a short time, and she made a perfect recovery without having been subjected to a nephrectomy. Had I removed this kidney she would in all probability have died, because there was not sufficient kidney tissue remaining to sustain life.

Dr. L. S. McMurtry, of Louisville.—Dr. Baldwin's cases are very interesting, and I have had an experience which is exactly a repetition of his first case, the case of large renal cyst, which, I gather from the doctor's report, was considered to be an ovarian cyst when the operation was done. With reference to such a cyst as the doctor has reported—and I can recall several cases as the analogue of that case—I do not believe there is any way to make a differential diagnosis. I agree with what Dr. Ross has said, that there are certain cysts of the kidney which present the physical signs of monocysts; yet there will be found the folds across as he has described, which are significant and are a great aid. In my own case the physical signs were those distinctively of a large ovarian monocyst. The case was handled very much the same as Dr. Baldwin did his case except that there was a very extensive vascular supply in the pedicle.

I concur with Dr. Ross in regard to dealing with the ureter. In quite a number of cases of nephrectomy, and in this case of large cyst, the ureter was not dilated as much as the essayist has described. I did not attempt to trace the ureter to the bladder and remove it, but left it, and it did not give any trouble. In my own case the operation was done on the 4th of July six years ago. She was a young woman, 24 years of age. The cyst was very large, its contents amounting to three quarts. She has since married and is in excellent health.

With reference to the second case reported by Dr. Baldwin, or the third one—I do not remember exactly which, but the one in which the tumor was in Douglas' space, and in which he did the combined vaginal and abdominal operation—I think his experience is a strong vindication of the superiority of the suprapubic method of dealing with all doubtful cases of intrapelvic tumors. In this instance, by making an operation through the vagina, Dr. Baldwin tore into the rectum and encountered extensive adhesions, and then he opened the abdomen. If I remember rightly, he then returned to the vagina, and finally removed the tumor through the abdominal route. His experience is an interesting and valuable one to us all.

Dr. L. H. Dunning, of Indianapolis.—There is one important diagnostic point in dealing with cysts of the kidney that has not been mentioned, and it is the location of the colon in respect to the cyst or the tumor. I once encountered a tumor that I diagnosticated as ovarian, and found it to be a hydronephrosis. Since then I have operated on five or six cases of tumors of the kidney, hydronephrosis, pus accumulations in the kidney, sarcomatous kidney, etc., and in no instance have I failed to locate the kidney behind the peritoneal layers. The kidney pushes the colon in front of it; if the tumor is large it crowds it outside, but in no case of tumor of the kidney have I ever found the absence of the kidney due to the presence of the colon over some portion of the tumor. In very many instances I have been able to demonstrate the presence of the colon in front of the tumor, in even large sarcomatous tumors of the kidney, by pumping the colon with air. In this way you can see the distended colon running over the outer border or centre of it. With this diagnostic point in mind I do not believe that it is necessary for us to make an error in diagnosis very often, although I must confess I did so in one instance, but it was before I learned the value of this test.

With reference to dealing with the ureter, I have removed three kidneys for tuberculosis, and in one instance I did not tie the ureter. I did not dissect it and remove it far down toward the bladder. I had considerable trouble following the operation for some time. I think it is unsafe, in tuberculosis of the kidney, to leave the ureter; I believe it ought to be removed low down in the pelvis and tied wherever it is left, and not followed clear down to the bladder. In other cases I have had no difficulty. I have extirpated the kidney eleven times, with one death.

Dr. Ross.—What ligature did you use, Dr. Dunning?

Dr. Dunning.—I used silk in that case; perhaps it was a mistake.

Dr. J. Henry Carstens, of Detroit.—We all experience more or less difficulty in making a diagnosis. While the diagnostic point brought out by Dr. Dunning is a good one, it is not always reliable. I recall one case in which I supposed I had to deal with an ovarian tumor, and it turned out to be a large hydronephrotic kidney. The kidney was very loose and a stone was found in it, quite large. When we have a loose kidney, which flops around and gets over the rectum, it may grow over the colon, and the colon in such cases is behind, not in front, of the tumor.

I recall another case of sarcoma of the kidney which extended down to the pelvis. The case was diagnosticated as an enlargement of the spleen, and the patient was brought to me for the purpose of removing the spleen. I thought it was malignant; I operated and found it was post-peritoneal. I removed it without very much trouble.

I remember one other case of large sarcoma of the right kidney that came under my observation many years ago. I

had supposed at first that it was a fibroid tumor. It pushed everything aside, so that it was absolutely impossible to get a tympanitic sound.

DR. JOSEPH EASTMAN, of Indianapolis (by invitation).—The statement of Dr. Dunning brings to my mind an experience I had recently which may be of interest to you. The late Dr. Charles T. Parkes, of Chicago, in classifying tumors of the abdomen, spoke of those which grow from below upward and those which grow from above downward. It has been my experience that all post-peritoneal tumors, such as spring from the kidney, are much less acted upon by the ascent and descent of the diaphragm than those that are located within the peritoneal cavity and are moved upward and downward by the inspiration and expiration of the patient.

I recently had a pancreatic cyst to deal with, as large as my head or larger, and it was very satisfactory to notice the ascent and descent of this tumor during inspiration and expiration—a thing not possible if the tumor had been post-peritoneal or connected with the kidney.

Dr. Dunning suggests that the colon is always in front of the tumor and can be dilated. This pancreatic cyst had distended the meso-colon to such an extent that the transverse colon was very perceptible, lying across in front of the cyst. So the diagnostic point which he makes is likewise applicable to pancreatic cysts.

DR. JOHN M. DUFF, of Pittsburg.—I saw a case of cyst of the kidney at the McKeesport Hospital. I did not see the patient previous to the day of operation. I was invited to assist in an operation for an abscess of the spleen, this having been the diagnosis that was made. The urine had been examined and found normal. The tumor was situated almost in the median line; it fluctuated and misled on account of the report that the urine was normal. Nevertheless I stated at the time that I suspected it was connected with the kidney instead of the spleen. A median incision was made. It was found that the tumor had pushed up the meso-colon, and the colon was adherent to the tumor around at the side, and the meso-colon had almost ulcerated through. The kidney was removed through the meso-colon. An examination had not been made with the Harris instrument for the purpose of ascertaining the condition of the urine from both kidneys. The patient made a good recovery.

DR. DUNNING.—I would like to ask Dr. Baldwin whether the use of the Harris instrument has been satisfactory in his hands, and whether it is reliable or not.

DR. BALDWIN (closing).—In regard to the remarks of Dr. Ross, I have noticed several times that in kidney tumors we could get a sort of separation, owing, I suppose, to the natural separation that exists between the lobules of the kidney. In my case, however, the cyst was so enormously distended that it filled the entire abdomen down to the true pelvis. It was almost as symmetrical as an eight-months uterus.

In regard to tuberculosis of the kidney, in only one case did I ever dissect out a tubercular ureter, and I found it a very difficult operation indeed, although it was accomplished successfully. I have been in the habit in these cases of leaving the end of the ureter alone. I operate outside of the peritoneum, so that there is no danger of infecting the peritoneal cavity. I do not use ligatures of any kind, but apply clamps to the pedicle of the kidney, including the ureter or not, as is most convenient. The clamps are left on for twenty-four to forty-eight hours. There is nothing left behind to produce a sinus. If you use ligatures they will become infected, if you have a tubercular kidney to deal with, and catgut is no better than the clamp. I use the clamp as in a hysterectomy. I have had no hemorrhage and no trouble. I have operated a great many times and feel perfectly safe. I have seen a number of cysts of the kidney which were directly hydronephrotic in character. In those I have incised, packed temporarily, drained, everything has healed up, leaving the kidney intact. I should hesitate to remove a kidney unless it were thoroughly destroyed. I have a patient now with two such kidneys, each kidney nearly the size of a fetal head. She is a woman 70 years of age and enjoys fairly good health.

With reference to the Harris instrument, I have used it ever since it was brought before the profession. I have been much pleased with it. It is a reliable and satisfactory instrument. It can be used quickly and with less trouble than ureteral catheterization. In the case of paranephric cyst I was deceived by it, for the simple reason that I did not leave it in long enough. The pressure of the paranephric cyst on the ureter as the woman was in the recumbent posture unquestionably obstructed the flow of urine from the ureter.

DR. L. H. DUNNING, of Indianapolis, Ind., read a paper entitled

ECTOPIC GESTATION: SHALL THE CASE BE OPERATED UPON AT OR NEAR TERM, THE CHILD BEING ALIVE ?[1]

DR. J. HENRY CARSTENS, of Detroit.—I agree with the essayist that the proper way, other things being equal, is to operate, when the child is living and viable, at once. As far as the operation is concerned, the placenta is not always attached to the broad ligament, and very often it can be enucleated. When rupture takes place, and the placenta is attached directly to the intestines, colon, rectum, or sigmoid, it is utterly impossible to remove it when the child is alive. I have seen such operations performed by other surgeons, but the patients invariably died from hemorrhage. (Cases were cited by Dr. Carstens.)

DR. L. S. MCMURTRY, of Louisville.—Last year, it will be remembered, we had a lengthy discussion on this same subject at Pittsburg, and Dr. Werder presented a specimen. By

[1] See original article, p. 592.

referring to one of the earlier volumes of the Association, you will find a case reported by me where the fetus had gone on to full term, was dead, and some weeks after a spurious labor, when there were beginning septic symptoms, I operated. The child had been dead for nearly three weeks, no fetal movements having been noticed during that time. The placenta was very large; there was no sign of any atrophic changes in it in consequence of the death of the fetus. It was spread out over one side of the uterus, over the colon and ileum. In attempting to enucleate the placenta the hemorrhage was very profuse. It was perfectly dreadful, the woman being exsanguinated inside of a minute. When we have a placenta disposed toward the broad ligament and uterus, as in the case described by Dr. Dunning, we have an excellent opportunity for complete enucleation.

DR. X. O. WERDER, of Pittsburg.—I am particularly interested in this subject, because I have had some experience with this class of cases. I have reported in the Transactions of this Association one case (I believe it was at the Toronto meeting) in which I did a laparatomy for ectopic gestation at full term, or within two weeks of full term, in which I succeeded in removing the placenta and about two-thirds of the sac. The rest of the sac was adherent to the intestines, and I found it advisable to stitch it to the abdominal wall. The hemorrhage during the removal of the placenta was severe, but I succeeded in controlling it promptly by clamping the uterine and ovarian arteries. The patient made a good recovery, and the child lived four days.

Nearly two years ago I had another case of ectopic gestation which came to me at about the seventh month. I kept the woman under observation at the hospital for months, because she was feeble, anemic, and broken down. I operated about a month before the end of term, because I thought the child would not be as much crippled as if we were to let it grow any longer. The abdomen was opened, the sac found complete, the fetus in the sac. The tumor was partly intraligamentous, but evidently the ligament had become ruptured, and the largest portion of the sac was in the general abdominal cavity. I began dealing with it the same as I deal with an intraligamentous or firmly adherent cyst. Without opening the sac, I broke up the adhesions, tied the bleeding points, and congratulated myself that I would have no trouble. In breaking up the adhesions I unfortunately perforated the sac at one point, and just at that time the patient began to strain, she not being completely anesthetized, and a portion of the fetal extremities —I do not remember now whether it was a hand or foot— pushed through the opening, and the patient still continued to strain, and all at once the fetus was extruded through the opening in the sac, and a very profuse and frightful hemorrhage occurred. The abdomen was literally filled with blood in a few seconds. Bleeding was controlled temporarily with towels; then my assistant compressed the abdominal aorta, and

during this pressure I rapidly removed the placenta without much hemorrhage. There was no more bleeding of any consequence after that. I enucleated the sac, removed the uterus, which was firmly adherent to a part of the sac, and left the patient in as good a condition as many of these patients are after a severe abdominal section. The pulse was 140, and in spite of stimulation it never improved. She died on the third day, when the pulse ranged from 140 to 170. I believe death was due as much to shock as hemorrhage in that case.

If we can remove the placenta and sac we should do so by all means. It is the only surgical method of dealing with these cases. Leaving the placenta to slough for a month or six months is all nonsense when we can remove it; with our present improved surgical technique we will succeed in removing both, just as we succeed in dealing with the pedicle in hysterectomy.

Dr. Joseph Eastman, of Indianapolis.—I have had a little experience in this work, and recall a case I had some ten years ago, the features of which are as forcibly and vividly impressed upon my mind to-day as they were then. I fully concur in the conclusions of the essayist. One of the speakers referred to a case in which he encountered a terrible and profuse hemorrhage. I can fully corroborate what has been said regarding such profuse hemorrhages. In the case I refer to the hemorrhage was very profuse. The patient upon whom I operated had an enormous mass in the abdomen. The ordinary incision was made; a large portion of the sac in front was completely gangrenous, so that the patient not only had a live child inside, but a dead sac. There was no fluid around the child in which it could float. By gentle manipulation the gangrenous portion gave way and we had at once a detached placenta, with all the horror of profuse bleeding. We threw hot bits of gauze about it, and this seemed to detach it all the more, and the hemorrhage became more and more abundant. A point which is of decided value, and familiar to you all, is to find out where the uterus is, and in these cases it seems to me very important to be able to find out the cornu of the uterus from which this tube has sprung and which contains the child. I immediately plunged my left hand down to find the uterus and found a mass as large as my hat. I could scarcely encircle the neck of the sac, as it emerged from the neck of the uterus, with my fingers. In doing so I found I was detaching more placenta and getting still more hemorrhage. The nurse in mopping up the blood could scarcely get enough away to see the margins of the wound. A clamp which I had invented for other purposes happened to be within reach. With the aid of the clamp I had expressed the placenta two-thirds out of the sac and had controlled the hemorrhage below. The child was still lying in there, the placenta being partially in front of the child. Having the hemorrhage controlled, I drew a long breath, and then began to separate formidable adhesions. It is my firm belief that one case may be favorable and we can shell

everything out nicely, while another may be exceedingly diffi-
cult to deal with. I may yet be in a corner where I shall leave
the placenta to slough out, but I have an abiding faith that I
never shall, providing I have material opportunity to seize the
cornu of the uterus quickly. It must be done quickly or the
patient will lose so much blood that she cannot recover.

DR. JOHN M. DUFF, of Pittsburg.—I have had very little
experience in operating on cases of extrauterine pregnancy at
term. It was my pleasure to be present at Dr. Werder's ope-
ration, but unfortunately I did not see his manipulation of the
placenta, because he had asked me to take charge of the child.
I got the child to breathe, but it died of pneumonia. No one
ought to be misled with the idea that we should allow a case of
extrauterine pregnancy to go on until viability of the child with
the idea of saving it; and, while it is not exactly germane to
the discussion, I believe, in every case of extrauterine preg-
nancy, as soon as the diagnosis is made, arrangements should
be perfected for an immediate operation.

DR. D. TOD GILLIAM, of Columbus.—Six or seven years ago
I read a paper before the Ohio State Medical Society in which
I advocated the removal of the placenta in every case of extra-
uterine pregnancy. I tried to show in that paper that it was ab-
solutely impossible for the placenta to have any vascular attach-
ment to any other part except coming from the natural source.
It was a beautiful theory and, I thought, incontrovertible. I
had four cases in which the child was viable up to that time,
and had removed the placenta successfully in each case. The
first thing I had after I returned home from the meeting was
a case of extrauterine pregnancy, treated by me in the same
manner as I had done before, and I lost my patient. I believe
that there are cases in which we cannot remove the placenta, but
we shall have to do the best we can under the circumstances.
I believe in the majority of cases, if we get the uterine cornu
in a case of extrauterine pregnancy, we will command the
greatest amount of blood supply. The time will come when
we shall be able to deal with these cases to better advantage
than we do now. We will take out the uterus in most cases
of viable child, going down wherever we find vessels and
clamping them, controlling the circulation connected with the
uterus, because this is the starting point from which the vas-
cular supply must come. If we can get hold of the vessels we
will succeed in many cases in deliberately removing the fetus
and its envelopes after we have secured the circulation.

DR. EDWIN RICKETTS, of Cincinnati.—A few years ago the
question of handling cases of extrauterine pregnancy success-
fully was about as important as the matter of dealing with
hemorrhage in this class of cases. There is one point concern-
ing which I desire to say a few words in reference to this sub-
ject of extrauterine pregnancy. Where the placenta is out
among the intestines (I do not care at what stage you begin),
after the abdomen is opened and you begin to tear off the
attached placenta, its peripheral margin should not be touched.

Forceps should be applied wherever it is possible over the uterine supply, and then catch the ovarian artery and you are at liberty to go ahead and shell out the placenta. I have seen cases of extrauterine pregnancy die of hemorrhage from that procedure. I wish to speak of a delayed case which came under my care last April, and as the result of neglect the child died. When the abdomen was opened the placenta was found split one-third into the uterus, and in order to save the patient a hysterectomy was done. The uterus was shelled out; appendicitis was found, and a five-inch opening was discovered in the large intestine which required fifteen interrupted sutures. I speak of this to show the folly of delay. The patient recovered after a hard fight of five weeks.

Dr. James F. W. Ross, of Toronto.—Since our last meeting I have had an unfortunate case, and I thought of the interesting report that Dr. Werder gave at a previous meeting. The case was one in which pregnancy had been diagnosticated, but in which there were apparently no symptoms of ectopic pregnancy. I myself could not think the case was one of ectopic pregnancy. I determined that the uterus was empty and a mass was behind the uterus in the cul-de-sac of Douglas. I operated, began to enucleate the sac, and found it stretched across to the right side of the pelvis. Blood began to well up as the placenta was separated from the bottom: it was in the abdominal cavity, attached to the large veins in the pelvis, and the bleeding was awful. I packed with towels, put on clamps, first on one (left) broad ligament, being careful not to injure the ureter, and, finding that the hemorrhage did not cease, I clamped the other (right) broad ligament. This stopped the hemorrhage to a great extent. I removed the sac. The patient lost a large quantity of blood, and died a day or two afterward from loss of blood or shock—I do not know exactly which.

These cases, to my mind, should not be dealt with as soon as they are diagnosticated. I do not agree with Dr. Duff in that respect. I believe that after the cases reach the fourth month it would be easier to operate on them at full term than to do so at either the fourth or fifth month. The sac is larger; the placenta is more definitely detachable, as it is in the latter months of pregnancy; and I consider the most dangerous time is about the fifth or sixth month of pregnancy.

There is one point Dr. Dunning did not mention in referring to the danger of these cases—that is, secondary rupture of the sac. I met with one case at full term in which secondary rupture occurred, with escape of the liquor amnii into the cavity. The woman nearly died.

Dr. Dunning (closing).—The discussion has taken a direction that I did not expect it to do. I only considered one question in the paper, and that was, in cases of ectopic pregnancy at or near full term, shall we proceed to operate, or allow the child to die and then operate? I did not discuss methods. I am glad, however, methods have been discussed. I believe we ought to

leave the placenta, except where it is attached above, or else where it is included entirely in the broad ligament. In dealing with the placenta we have not yet reached a method which is not open to some objection. Frequently we resort to one method at one time, and another at another time, on account of the variety of anatomical conditions to be found. For instance, we may have a form of ectopic pregnancy which is intraligamentous, retroperitoneal, where the placenta is attached above and never disturbed, or attached to the interior of the Fallopian tube. In such a case we can tie the horn of the uterus, begin at once enucleation, and have no hemorrhage whatever.

My reason for having brought this question before you is that in all of our late text books, with but one exception, so far as I am acquainted with them, we are advised to wait for the death of the child before operating, where we find the case just at the close of the period. This is the advice given by Bland Sutton; it is the advice (in substance) given by Greig Smith. It is likewise the advice given by Lusk in his article in Coe's book; he says, however, it looks as though we had reached the time when we need not fold our hands and wait for the child to die. I hold a different view now from what I did when I operated on a case in January. My views have changed in consequence of a statistical study of the subject. The tables which have been presented to us heretofore have been faulty and exceedingly misleading, especially those presented by Bland Sutton, which are the most elaborate of any tables heretofore presented, and it was to refute the idea of Bland Sutton that I wrote my paper.

DR. L. S. MCMURTRY, of Louisville, Kentucky, read a paper entitled

SOME OBSERVATIONS, CHIEFLY CLINICAL, UPON THE TEMPE-RATURE AFTER INTRAPERITONEAL OPERATIONS.[1]

DR. JAMES F. BALDWIN, of Columbus.—I have noticed for several years a rise in temperature a few hours after, or more frequently within twelve hours following, these sections. I have long ceased to be anxious if the pulse and the general condition of the patient were good. I have not had the fear of infection, from the fact that the fever does not follow the course of ordinary infectious fevers and comes on too soon after the operation for infection to take place. I have noticed a point which the essayist does not call attention to—that in those cases in which the temperature goes up to $100\frac{1}{2}°$, or seldom beyond that except in nervous women, there has been preceding it and following immediately the operation a depression of temperature, due, I suppose, to some form of shock, but not to hemorrhage, because this decrease in temperature occurs without regard to hemorrhage. The nurse who has not had much experience sometimes ominously puts her finger on the tem-

[1] Paper not received in time for publication.

perature chart, showing that it is going up. I glance at the pulse record of the same chart, and find it is incidental, as it does not advance any theory. It is simply reactionary fever. There has been a little shock perhaps and depression, and, like the bounding of a rubber ball, the temperature goes above normal, and in these cases I regard it largely of nervous origin. In this connection I recall my first or second vaginal hysterectomy, done a good many years ago. My patient was exceedingly nervous and I was also nervous. Her temperature before operation went up to 102°, the pulse accordingly. I could find nothing to account for it. I regarded it as being purely of nervous origin. The hysterectomy was made, the temperature soon dropped to normal, and she made a beautiful convalescence.

Dr. JOSEPH EASTMAN, of Indianapolis.—I have been very much interested in the excellent contribution of Dr. McMurtry. I believe the majority of abdominal surgeons place more importance upon the pulse as an indicator of the condition of their patient than they do upon the thermometer; yet it cannot be denied that in the thermometer we often have a very good instrument to tell us about certain things in the case. As the essayist intimated, the time at which the temperature appears is of considerable importance. For instance, we get a reactionary temperature within the first twenty-four hours, and we usually regard it and give it but little attention. Let us put our patient to bed; she gets along nicely; the temperature ranges from 99° to 99.5° during the first twenty-four or forty-eight hours. On the evening of the third day we get a very insidious rise of temperature; it runs to 101°, or perhaps not over 100.5°. We observe a corresponding increase in pulse rate. The temperature runs up to 103–4°, and for a while the pulse has a good volume. It does well, although rapid. The temperature may reach 104°; we have a sudden drop in arterial pressure; the patient becomes cold; antipyretics or cold baths have no effect. The higher the temperature goes the colder the patient gets, and the next thing we know we have a case of sepsis and are going to have a death in spite of all we can do. Then, again, if we have a high temperature without much effect upon the pulse, along toward the sixth or seventh day, we simply open up the wound and expect to find a stitch abscess. There is one thing I have observed—namely, that as long as the patient has a good, warm skin, the skin warm in proportion to the temperature, we need not regard it as of great importance. But it is the patient who does nicely and ideally, so to speak, for the first three days, and on the evening of the third day has a sudden rise of temperature with a corresponding increased pulse rate, that worries me, and I expect a death shortly.

Dr. J. HENRY CARSTENS, of Detroit.—If we have a case of suppuration and operate, what do we do? Do we open up a lot of lymph channels? If we do we create raw surfaces, and in spite of the greatest care there will be a transudation of

some of the septic material, which will come in contact with the raw surfaces, and the result is, as soon as we get through with the operation or shortly after, there is septic infection, the absorption of a great amount of material, and, no matter how much we flush, we cannot wash it all away. The temperature goes up; Nature kindly, by leucocytosis or phagocytosis, takes care of the septic material, and in the course of twenty-four hours all of this material is eliminated and the patient is all right. That is the way I have explained the early rise of temperature in these cases after operation. Without doubt the temperature will rise or fall without reference to any bacteriological infection.

Dr. John M. Duff, of Pittsburg.—I recall two cases in which the temperature went above the point which our ordinary thermometers record. I have forgotten the exact temperatures, but I think in one case the temperature rose to 117° and in the other 120°. In one case I did a curettement, shortly after which I was very much alarmed to find that the temperature had risen to 107°. In a little while it was 110°. My patient was nervous and becoming delirious. A neurologist told me that I had a case of brain fever. At the end of a couple of hours I found the young lady's temperature normal. In a few hours again it had risen to 110°. I will furnish the exact records of this case for the Transactions.

Dr. W. E. B. Davis, of Birmingham, Ala.—Unquestionably there can be elevation of temperature without infection. Surgeons who have witnessed injuries of magnitude in which there was no injury to the skin, but where there has been depression, have seen a corresponding elevation of temperature. Dr. McMurtry emphasized an important point—namely, that much depends upon the dose of infection. In many cases where we do not have pus formation and the wound heals by first intention, there may be enough infection to cause some elevation of temperature. We have patients who bleed a good deal; this goes with a little infection, and they will have a considerable temperature after operation. Another point is infection from the intestinal tract, which causes elevation of temperature. After operation the liver sometimes does not perform its function properly; there is excessive bile production for a time, just as the urine in abdominal operations is reduced to a small quantity, and the injury to the abdominal sympathetic ganglia produces intestinal paralysis. Unquestionably autoinfection is a frequent cause of elevation of temperature, as demonstrated by the rapid reduction in temperature after free purgation. It is not a beginning peritonitis that causes these temperatures. It is a temperature from autoinfection, and the purgation, by relieving the paralysis, affords relief.

Dr. H. O. Pantzer, of Indianapolis.—My observations and experience have led me to the standpoint taken by the essayist. Any rise in temperature should ordinarily be construed as being due to infection. I will not take the extreme ground that nervous influences may not bring about a rise in tempera-

ture; they undoubtedly do. but I am chary to accept it in any case after operation. From observation I have satisfied myself that a rise in temperature early after an operation is ordinarily ascribable to a nasal septicemia. The prevalence of nasal catarrh is such that we may look for a rise of temperature owing to nasal conditions by the change the patient has recently undergone. From the alternating upright position to one of protracted recumbency, we have a condition which will give rise to occlusion of the nose and to retention of nasal secretions, as well as conditions which favor bacterial propagation, the formation of toxins, and the ultimate development of septicemia.

DR. WALTER B. DORSETT, of St. Louis.—The matter of ptomaine poisoning has been dealt with to some degree. We have trouble that comes from the secretion of the intestines, but nothing has been said about the kidneys. Last Wednesday I did a vaginal hysterectomy for carcinoma, and I know of no operation in which I felt more anxiety for the condition of the patient afterward. About twenty-four hours after the operation the total amount of urine excreted by the kidneys was two ounces and the temperature went up to 103°. Chloroform was the anesthetic used. Vomiting was so prolonged that it was impossible to give her any liquids by the stomach, and upon chemical examination of the urine I found it almost half albumin. I resorted to transfusion with normal salt solution, as well as enemata of normal salt solution carried high up in the rectum, and was rewarded in the course of twelve or fourteen hours in finding the temperature drop to $99\frac{1}{2}°$, and it has not gone beyond that point since. I therefore think we ought to consider always the anesthetic that is used; secondly, we should consider the condition of the kidneys, and in this respect I believe we have a reason for abnormal temperature after operation in many instances.

DR. L. S. McMURTRY (closing).—It is a very well known fact, frequently observed clinically, that, either from physical or psychic shock, the temperature runs up very high in surgical cases. The temperature rises on account of systemic conditions, such as gastro-intestinal disturbances, as mentioned by Dr. Davis, and impaired action of the kidneys and other excretory functions, as pointed out by Dr. Dorsett. These are well-known conditions. What I desired especially to call attention to was the uncertainty of the classical explanations now given as to this rise of temperature that occurs immediately following surgical operations, it being attributed to fibrin ferment, to the presence of nuclein, and to the absorption of disorganized tissues as a result of the operation. This, it seems to me, is very far from being proved or explaining the condition.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Induction of Premature Labor.—Spineli [1] describes a new and simple method which he has tried successfully in a number of cases. The patient undergoes the usual preparations as for confinement, such as a bath, emptying of the bladder and rectum, and thorough disinfection of the external genitals. The operator disinfects the vagina and cervical canal. A speculum is introduced, the cervix exposed, seized posteriorly by tenaculum, and drawn forward. In primiparæ, or in cases in which the cervix is not sufficiently opened to permit the introduction of a finger, it is dilated with a metallic dilator. The index finger is then introduced through and above the internal os, and the membranes carefully separated as far as possible, care being taken not to rupture the membranes. Next a long strip of sterilized gauze saturated with ichthyol is introduced up into the lower pole of the uterus, under the guidance of the finger, and packed as firmly as possible, thus filling the space between the membranes and the uterine wall. The vagina next is tamponed with gauze. A T-bandage is applied and the patient remains in bed or on a couch. Pains soon make their appearance, and the forcible expulsion of both the uterine and vaginal tampon indicates the progressing labor and dilatation of the birth canal.

Indications for Cesarean Section, Symphyseotomy, Craniotomy, and Induction of Premature Labor.—Leopold [1] bases his conclusions upon 25,000 cases of labor observed in the Dresden clinic. The degree of pelvic contraction, and whether the woman is a primi- or multipara, influences the indications; the fetus is understood to be full term, well developed, and of an average weight of 3,200 grammes.

1. *Primiparæ.*—Practical experience teaches that it is necessary to differentiate three degrees of pelvic contraction. *First degree*, with a conjugata vera to seven centimetres, contracted in the transverse diameter and of flat rachitic type: in the uniformly contracted pelvis, seven and a half centimetre conjugata vera is the limit. *The second degree* of contraction comprises pelves with a conjugata vera of seven and a half centimetres to six centimetres. *Contractions of the third degree* include all pelves with a conjugata vera of six centimetres or less. Normal deliveries in a pelvis contracted to the first degree are almost daily observations. This presupposes, however, a favorable presentation, good moulding of the head, ample labor pains, and preservation of membranes until full dilatation. The maxim in these cases is patience and a careful guarding of the mother against exhausting herself.

The fetal heart sounds should be watched and the membranes preserved as long as possible. The attending physician must bear in mind that pelvic contraction does not necessarily indicate obstetrical interference. It is in these cases that the greatest errors are committed, and many uncalled-for operations are performed because the principles involved are not properly understood. Uncalled-for rupturing of the membranes is usually followed by complications, such as prolapse of the cord, retarded dilatation, exhaustion of the patient, and the irregular fetal heart sounds; finally the confused attendant seeks help in the forceps and performs an operation rarely indicated, and usually fatal to the child and often to the mother. Should the membranes rupture early on their own account, with pains insufficient and irregular, soft parts resistant, and the head not moulded, the colpeurynter and Walcher's position should be tried before resorting to operative interference. The colpeurynter replaces the membranes to a certain extent, prevents the escape of liquor amnii, improves the pains, and prepares the soft parts for the descent of the head. It is no longer a theory but an actual fact that Walcher's position increases the diameter of the inlet from one-half to one centimetre and facilitates the descent of the head through the inlet into the pelvic cavity. These two aids are frequently employed in the Dresden clinic, and often with surprising and gratifying results. The author refers to his publication of numerous cases in which serious operations, such as high forceps and symphyseotomy, were avoided.

Next the cases in which these means are not successful are discussed. For all practical purposes these cases belong to the second class of pelvic contraction, which precludes normal labor and always necessitates one or the other obstetrical operation. In hospitals with ample facilities and trained assistance, fetal heart sounds normal, Leopold advises Cesarean section. Symphyseotomy is not favored, because this operation usually necessitates the subsequent application of the forceps, places the life of the fetus in greater jeopardy, the risks to the mother at the same time are not less and the after-treatment more complicated and tedious. With the fetal heart sounds continuously irregular and accompanied by a discharge of meconium—in other words, if the condition of the fetus indicates grave circulatory disturbances—it is not considered advisable to endanger the mother's life and perform Cesarean section. Under such circumstances Leopold still considers craniotomy a justifiable operation, and dissents from those who hold that perforation of the living fetus, even if moribund, is never justifiable. In private practice—that is, if the surroundings do not afford the essential requirements for abdominal operation —the author considers both Cesarean section and symphyseotomy contraindicated and strongly advises (that is, if the patient cannot be transferred to a hospital) perforation of the fetus. The third group of pelvic contractions, with a conjugata vera of six centimetres or less, always necessitates Cesa-

rean section. Forceps and version cannot accomplish delivery, and both symphyseotomy and craniotomy are exceedingly difficult operations under such conditions, and usually prove fatal.

2. *Multiparæ.*—It is a well-known fact that with every successive pregnancy the fetus increases in size and weight. The disproportion between head and pelvis is therefore greater and the resistance to the descent of the head increased. These facts have led to the artificial induction of premature labor— an operation which even to-day competes successfully with Cesarean section and symphyseotomy, and in private practice deserves special attention. Induction of premature labor is suitable for pelvic contractions of the first degree. The proper period for the induction is the thirty-fifth week of gestation. Successful methods which have stood the test for years are the introduction of the bougie or intrauterine rubber balloon dilator. If the bougie is employed care must be taken not to injure the placenta, and the diagnosis of the location of the placenta is of advantage. The diagnosis of the location of the placenta is easy if the direction of the round ligaments or tubes is mapped out. If the tubes or round ligaments converge anteriorly the placenta is located on the posterior uterine wall, and if parallel to the longitudinal axis of the uterus the afterbirth has engrafted itself upon the anterior wall. This theory has been fully explained in some of the author's previous publications and its correctness verified through numerous Cesarean sections. The preservation of the membranes is essential. Experience has also proved that pelvic presentations rarely result in the birth of a living child, therefore the head must present. Walcher's position is of decided benefit and facilitates the descent of the head into the pelvis. Accurate pelvic measurements, exact diagnosis of the duration of pregnancy, and proper facilities for preserving the undeveloped child are the requirements for success both in private and hospital practice. If the physician does not see his patient before full term and the onset of labor pains, the preservation of the membranes is again the first principle requisite for success. Normal deliveries under such circumstances are by no means rare, but all three aforenamed factors must be present. The early introduction of the colpeurynter preserves the membranes and tends to increase the force of labor pains. Patience and careful observation are again cautioned, and no interference until the os is fully dilated. With moderate contraction, nine, eight, or even seven centimetres, favorable presentation, strong labor pains, the colpeurynter is frequently forced out of the vagina, the membranes rupture spontaneously, and the head soon appears in the vulva and is delivered without artificial aid. In many cases, however, the colpeurynter is not expelled, although pains are strong and the cervix dilated ; the head remains above the inlet in spite of Walcher's position, and the hard cranial bones do not mould. Under such circumstances one is tempted to rupture the membranes in the

hope that the strong pains will force the head past the obstruction. Experience, however, demonstrates that this is a delusion. The chances of obtaining a living child are better if the patient is placed in Walcher's position and version and extraction performed.

Leopold is an enthusiastic advocate of this method of elective version, and repeated statistics published from his clinic have demonstrated its great value and possibilities. Although version may be successful some hours after the membranes have ruptured, the most favorable time has passed by and the difficulties have increased. In another type of cases the pelvis is contracted to seven and a half or seven centimetres; membranes have ruptured some hours and the head is still above the inlet; the cervix is fully dilated. Version on account of uterine retraction is too dangerous and must not be attempted. With the child dead the indications are clear and self-evident. With a living child Cesarean section or symphyseotomy comes into question. In private practice, with unfavorable surroundings, craniotomy is usually selected. The condition of the mother and child is important and influences the selection of the operation. The author is decidedly in favor of Cesarean section; whether the conservative or Porro operation, depends upon the patient's general condition. In Leopold's experience the Porro operation gives a better prognosis if the patient's general condition does not warrant the protracted administration of chloroform, and he relates cases in which he performed the operation under local anesthesia and hardly any chloroform. With the fetal heart sounds irregular. indistinct. indicating impaired vitality, the author does not subject his patients to the greater risks of symphyseotomy or Cesarean section, but prefers to perforate the moribund child. Better perforate once too often than perform a Cesarean section only to deliver a dead fetus. The third group of cases almost invariably necessitates Cesarean section, and both symphyseotomy and craniotomy are usually impossible operations

Cesarean Section or Symphyseotomy.—Fancourt Barnes [18] states that in his opinion the operation of symphyseotomy has not justified its existence, and that he believes those who have been advocating it will abandon its use. Induction of premature labor, within certain limits, will always hold a recognized and useful position among obstetric operations. He believes that Cesarean section is a scientific and justifiable operation, and that it will be more widely resorted to in the future as the science of obstetrics advances.

Abel [7] reports 52 cases of Cesarean section and 25 symphyseotomies from the University Clinic of Leipzig, and compares the final results of these two operations. Division of the symphysis always leaves more or less mobility of the joint, which, however, does not necessarily interfere with locomotion. Symphyseotomy increases the pelvic diameter permanently and makes subsequent confinements easy.

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Cesarean Section.—Wertheim [*] reports a case of Cesarean section in which a cervical fibroid obstructed the pelvic outlet and threatened the patient with rupture of the uterus. The woman, a primipara 32 years old, had been in labor for three days. After opening the uterus its contents were found to be in an advanced stage of decomposition, and for that reason the whole organ was extirpated. Recovery.

Cesarean Section after Vaginal Fixation.—A woman 24 years old had a movable retroflexion for which vaginal fixation was performed. Three years later the woman became pregnant, and when at full term the abnormal fixation of the organ prevented dilatation of the cervix, and the patient was threatened with rupture of the uterus. Cesarean section became necessary and a living child was delivered. The woman died three days post partum from sepsis.

Fuchs [3] also reports a case of Cesarean section for vaginal fixation, which, however, terminated more successfully. The operation preceded pregnancy about one year. Labor began with severe hemorrhages. The os was directed upward and backward.

Rupture of the Uterus after Vaginal Fixation.—At a recent meeting of the Munich Gynecological Society, Frickhinger [12] demonstrated the specimen of a uterus ruptured intra partum after vaginal fixation. The history of the case is as follows: VIpara, 30 years old, entered the clinic January 6, 1899, at 6 A.M. First three confinements normal. 1895, vaginal fixation for uterine displacement. Fourth confinement 1897, version, dead child. The woman was well nourished. Conjugata vera was nine to ten centimetres. Vaginal examination showed vagina wide and roomy; os toward the right, barely within reach, size of a half-dollar; membranes not ruptured, protruding through the cervix; head above inlet, barely within reach. Pains at long intervals. Introduction of colpeurynter, which was expelled at 11 P.M. Immediately after this, os was fully dilated; head deeper, but still movable; only a small segment has entered the inlet. Left occipito-anterior position, heart sounds normal. At 6 A.M. fetal heart sounds suddenly inaudible, and, as the position of the head contraindicated forceps, version was performed. Version very difficult on account of circular thickening of the uterine wall, which makes it almost impossible to grasp the feet. Child asphyctic, but revived. Uterus contracted, and placenta was expelled spontaneously; no hemorrhage. In the evening, pulse 120, abdomen painful, followed by vomiting and distension of the abdomen. The patient died on the fifth day post partum of general acute purulent peritonitis. Postmortem showed a purulent hemorrhagic peritonitis due to rupture of the vagina and posterior uterine wall, corresponding to the point where the uterus was fixed to the vagina. The anterior lip of the cervix could not take part in the dilatation of the os, and for that reason the posterior lip was unduly stretched and predisposed to rupture.

GYNECOLOGY AND ABDOMINAL SURGERY.

Intestinal Obstruction.—Leopold[9] reports a case of intestinal obstruction in a woman from whom eleven years previously the right ovary had been removed. After the usual remedies had given no relief the abdomen was opened, and the cause of the obstruction was found to be a bridge of tissue extending from the uterus to the side of the pelvis; behind this a loop of small intestines had been caught. The gut was not sufficiently diseased to warrant resection. The patient made a rapid recovery.

Primary Tuberculosis of the Vulva.—Reick[12] observed in a woman with a negative family history, who, however, was married to a man afflicted with pulmonary phthisis, an ulceration of the vulva accompanied by hypertrophy of the labia minora. The secretion and surfaces of the ulcer contained numerous micro-organisms. The whole ulcerative mass was excised and carefully investigated. After a protracted search typical tubercular structures were found, consisting of giant cells, masses of cheesy degeneration, and characteristic tubercle bacilli.

The author believes that all the cases classified by Veit as ulcus rodens, accompanied by a hypertrophy or elephantiasis of the vulva, are probably of tubercular character.

Death following an Intrauterine Injection of Chloride of Zinc.—Schmid[13] relates a case in which injections of chloride of zinc were given three times without producing any alarming symptoms. The fourth time, however, the injection was followed by severe pains and a fatal peritonitis. A postmortem examination revealed erosions of the tube and the adjacent peritoneum from the solution which had escaped from the tube.

Atmokausis.—A case of sepsis following abortion was unsuccessfully curetted. Meuttner[14] performed atmokausis, steaming the interior of the uterus for thirty seconds with steam raised to 110°. The fever continued for three days, after which the temperature became normal and recovery was uninterrupted.

Statler[14] reports his experience in vaporization of the uterus and results obtained, which are very encouraging. The fatal case occurring in Treub's clinic is ascribed to a perforation of the uterus with the dilator. His conclusions are as follows: Vaporization may replace curettement if the patient cannot afford the time required for the latter operation. It rarely fails to arrest even the most persistent uterine hemorrhages, and can be applied without assistance or anesthesia.

Ovariotomy.—Marcus Rosenwasser[20] believes that ovariotomy is a simple operation with scarcely any risk. Malignancy, trauma, torsion of the pedicle, infection, suppuration, adhesions to viscera, and pregnancy materially increase the difficulties and risk of the operation. The removal of ovarian growths should follow the diagnosis without unnecessary delay. All

ovarian tumors should be considered malignant until proved otherwise.

Sarcoma of the Uterus.—F. H. Davenport[21] describes a case of sarcoma lasting five years before the uterus was removed. Nine months after the operation the woman was in good health. The tumor was found to be a myxosarcoma which started in the fundus.

S. J. Mixter[21] reports a case of sarcoma of the uterus operated upon eleven times, but not until the seventh operation did the microscope show anything malignant. The eighth time she was operated upon hysterectomy was performed, but the growth had invaded the surrounding organs. The last operations were done to relieve the pain. He reports this case to show the necessity of early radical operation in all cases of recurrent uterine growth or hemorrhage, whatever may be the result of the microscopical examination.

Myxosarcoma of the Uterus.—E. H. Mackay[21] cites a case of myxosarcoma of the uterus and vagina occurring in a woman 63 years old. The growths were removed manually and with the curette. The patient was discharged in twenty-one days relieved.

Parotid-gland Extract in the Treatment of Ovarian Disease.—E. P. Mallett[22] has observed the following effects from the use of this extract. It has seemed to relieve the pains of dysmenorrhea in all cases, without regard to the supposed cause or pathological condition present, to a greater extent than any of the numerous so-called uterine sedatives. It relieves those dull aching pains referred to the back and ovarian regions, usually designated by those familiar though vague and unsatisfactory terms, reflex pains, ovarian neuralgia, etc. Menstruation, when deranged, seems to become more regular as to periodicity, less in amount, and shorter in duration. During its exhibition pelvic exudate seems to soften and become absorbed more rapidly under abdomino-pelvic massage. The only contraindication to its use has been in cases of the artificial climacteric, in which cases the flashes of heat and cold were made distinctly more frequent and severe.

Abdomino-sacral Method for the Removal of Rectal Carcinoma.—H. O. Sommer[23] describes an operation performed at Kraske's clinic as follows: The tumor was located high up in the pelvis and intimately adherent to the sacrum and uterus. Two fingers' breadth above and parallel to the left Poupart's ligament an incision was made dividing the abdominal coverings from the vicinity of the anterior superior spinous process of the ilium to the median line. The pelvis of the patient being highly elevated, extrusion of the viscera was easily prevented and the abdominal cavity shut off by gauze pads. The tumor was firmly adherent to the uterus and sacrum. The peritoneum was transversely incised posteriorly in the region of the promontory, and also laterally and anteriorly in Douglas' cul-de-sac; the meso-rectum was also incised,

and at the same time a large branch of the superior hemor-
rhoidal was ligated.   The peritoneum was separated from the
intestine, and the intestine from its communications with the
adjacent parts.   The intestine was penetrated owing to the
fragility of its walls. After the rectum had been entirely freed
by the hands with very slight hemorrhage, the cavity was
packed with gauze and the patient placed in the right late-
ral position.   The typical incision was made.   In the superior
angle of the sacral cut one came directly upon the gauze in the
cavity.   The carcinoma was now easily drawn out through
the sacral incision, and after completely walling off the abdom-
inal cavity by means of gauze, the carcinoma was easily excised
and the anastomosis of the resected gut could be made with
ease.   Kraske is inclined to recommend this combination of the
abdomino-sacral method for nearly all cases of rectal carcino-
ma, and certainly for those in which the tumor is situated high
above the anus.   The advantages of this operation are obvious.
In the first place, the general shock which would first seem
natural in consequence of the addition of the first step—the
abdominal entrance to the already by no means conservative
sacral approach which follows—proved to be no item in the
consideration; on the contrary, the ease of access to the actual
field of operation is so much increased that, if anything, the
general depression is less than would result from an attempt
to work through the inadequate posterior entrance alone; and,
moreover, tumors which are practically inaccessible by the
sacral route alone become accessible and hence make the abdom-
inal-sacral method almost imperative in certain cases which
would otherwise have to be pronounced inoperable.   Another
great advantage is the fact that by this new method the part
of the intestinal tract which comes into consideration during
the operation is not only rendered more approachable, but can
be actually so far drawn out of the sacral wound, and the ab-
dominal cavity so well shut off with gauze tampons, that the
removal of the tumor and resection of the rectum can be ac-
complished, so to say, extraneously to the patient and with a
minimum danger of infection—a danger which Kraske consid-
ers of great moment for the prognosis of a good result.

Concealed Menstruation.—A. Brothers [24] describes the
case of a patient who complained of the following symptoms:
Once every four weeks she thinks she is going to be unwell.
She suffers pelvic cramps of such intensity as to confine her to
bed for three days, but, in spite of her suffering, she fails to
see a trace of menstrual blood.   After the third day she feels
perfectly well and suffers no pain during the intervals.   As the
time for the next period approaches she becomes drowsy.
This cycle of events has been recurring with mathematical
precision for a period of five months.   On examination the
uterus was found anteflexed and pushed forward by a cystic
tumor of considerable size in Douglas' cul-de-sac.   The patient
was placed under ether and the posterior vaginal wall incised

and the cyst punctured, when six or eight ounces of dark, tarry, unclotted blood were drawn off. A careful examination revealed extensive adhesions and a second tumor higher up on the right side. For these reasons it was thought advisable to open the abdomen from above. The second tumor was freed from above, but burst at one point and allowed about a pint of the same tarry fluid to escape into the abdominal cavity. The cavity was at once washed out and the wound closed. The patient developed an acute nephritis and a pleuro-pneumonia a few days after the operation, but these subsided and she has remained well for eight months. Both specimens consisted of ovarian sacs, in which the parenchyma was entirely absent. Each one communicated by an artificial opening with the corresponding Fallopian tube. The openings at the fimbriated extremities were completely obliterated. The tubes were not particularly increased in size, but at their outer ends seemed to be flattened and agglutinated to the walls of the ovarian sacs. Brothers believes this to be a case of primary menstruation into the ovaries.

Rectal Irrigation in Gynecology.—C. R. Hyde[24] has found rectal irrigation of distinct value in 1: Leucorrhea. 2. As a substitute for vaginal douching in young girls. 3. Acute and chronic ovarian and tubal lesions, with the possible exception of pyosalpinx. 4. Intestinal paralysis following sepsis. After major pelvic operations, to relieve any abdominal discomfort or tympanites. 6. Intestinal colic. 7. Doubtful in constipation. As regards technique, a few minor but important details are essential. The tubes are best when made of glass. It is preferable to use a large-sized tube, and, prior to using, thoroughly anneal to diminish its brittleness. Insert into the rectum as an ordinary rectal tube, using no unnecessary force. Either Sims' or the dorsal decubitus may be elected. At least two gallons, preferably six to eight, 110°–115° F., give best results. A gentle backward and forward motion of the tube, accompanied by a slight rotary action, is necessary to dislodge any particle of fecal matter which may obstruct the lumen, and also to prevent any drawing of the rectal mucosa into the fenestra.

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DISEASES OF CHILDREN.

Chorea and its Relations to Dentition.—Dontcho Mikhaï-loff [1] gives the history of various theories held in regard to the etiology of chorea, and then states that Prof. Baumel holds that anemia is the predisposing cause and dentition the occasional determining cause, the dental branches of the trigeminal being the centripetal pathway of excitations emanating from the teeth in difficult dentition. The blood is the moderator of the nervous system, as was said by the Father of Medicine; and in anemia, the blood, being physically and chemically abnormal, loses its influence, whence the occurrence of strange and varied nervous phenomena. Nearly all patients suffering from Sydenham's chorea are anemic, but the author thinks that of itself alone it would not suffice to produce chorea. The defective or difficult evolution of the teeth, more especially of the posterior and permanent molars, is apt to be the determining cause. Treatment should consist in measures directed to the assistance of dental evolution (phosphate of lime), to the condition of the gums, to the combating of anemia by tonics, in sedatives for the nervous system (bromides, etc.), and in the expulsion of intestinal worms if any are present. The feeding of the patients is rendered difficult by their defective teeth and by the inco-ordination of movements. Hence nourishing liquid foods should be given, such as milk, chocolate, soups, purées, eggs. etc.

Chronic Intestinal Indigestion in Children.—R. R. Stawell [2] considers that in the treatment of this disease the essential point is to recognize the fact that farinaceous food is not digested, and that therefore all forms of starchy foods must be entirely prohibited or materially lessened. Fats cannot be digested well; the author has often thought that many of the cases were increased in severity by a too confident belief in the virtues of cod-liver oil as the only remedy for all wasting diseases of childhood. The diet should consist almost entirely of milk, meat, and eggs. A small amount of carbohydrates may be given in the shape of sugar, malted foods, and baked bread or toast. While acknowledging the difficulty of constructing a sufficient and suitable diet for these cases, the author usually recommends some such dietary as the following for a medium case of the disease in a child 4 years of age: *Breakfast:* A cup of skimmed milk containing a tablespoonful of lime water, and further diluted with water if curds appear in the stools; a piece of baked dry toast, and occasionally part of a lightly boiled egg. *At 11 a.m.:* A cup of mutton or chicken tea and a small piece of dry toast. If there is constipation a cup of malted milk with one or two extract of milk biscuits. *At 1 or 1:30* (dinner): A small slice of underdone mutton or beef, or part of some fish, or a piece of chicken or tripe boiled with milk. No ordinary vegetables, but some baked dried bread crumbs are permitted, and if there is constipation and the case is not severe, vegetable marrow and spinach may be ordered.

As puddings, the author permits junket (rennet pudding), lemon sponge, or white of egg and sugar in any simple form, and jellies, and later rusk pudding, and finally macaroni as the least objectionable of the starchy foods; but for some months none of the ordinary puddings are allowed. Weak brandy-and-water, or soda-water alone, may be permitted as a drink at dinner. *Tea:* Fish or chicken, dry toast, and a drink of skimmed milk and lime water. On going to bed a drink of brandy-and water, if the child is very anemic, with cold hands and feet, or preferably, in most cases, a cup of malted milk, is given. On account of the neurotic element in some of the cases, much of the permanency in the success of treatment depends upon a wholesome home régime and a salutary form of discipline. Exercise in the fresh air, gymnastics, massage, bathing, suitable clothing, all play a part in the cure. The children must not be allowed to over-exercise. As to drug treatment, the author has found minute doses of rhubarb or rhubarb-and soda of value. In milder cases he has seen improvement due to a tincture of nux vomica and soda mixture. When there is marked constipation the compound decoction of aloes is beneficial, more so in the winter than in the summer, when it is apt to be too irritating, exciting looseness of the bowels. The author has often thought that if there was a due recognition and successful treatment of the two commonest minor ailments of later childhood—*e.g.*, post-nasal growths and chronic intestinal indigestion—within a few generations the soundness of health in body and mind, and the happiness and prosperity of the human race, would be materially and permanently increased.

Cretinism, Sporadic.—W. G. Putnam [3] reports the case of a child first seen by him at the age of 4 years and 2 months, when she was 29 inches in height, weighed 23 pounds, with a waist measurement of 22 inches and navel 21 inches. She had the typical " wooden " expression of a cretin, coarse, dry hair, a small umbilical hernia, and a very dry, scaly skin. The latter was so pronounced that on taking her clothes off and shaking them they seemed to be filled with bran. She seemed to take but little notice of what was going on around her, and would stand for hours by a chair, turning over books or other simple toys. The bowels were obstinately constipated. No evidence of rickets. Treatment with thyroid extract was begun September 18, 1897, in daily doses of the equivalent of one-sixth of a sheep's thyroid, increased later to twice the quantity. No systemic disturbance was ever induced thereby. Progress was steady, and on May 23 of this year the patient could not be recognized as the same child. She was 38 inches in height and weighed 37 pounds. She could talk as plainly as her brother, two years younger, and was running about and enjoying herself as a healthy child should. She took an intelligent interest in things about the house and farm, and looked after her own interests in every way.

G. Gordon Campbell [3] reports the case of a patient first seen

in May, 1898, and then 5 years old. She was considerably under average height for her age. with a short, thick body, large head, and limbs rather large in proportion to the trunk. The face was round and fat, the eyelids thick and palpebral apertures narrow, the nose wide and flattened, and the lips thick and prominent, with the large tongue most of the time protruding between them. Hair dry, lustreless, and hard to keep in place. Abdomen large and prominent, with a small umbilical hernia. Skin dry. Child's expression was the characteristic dull, stolid stare of cretinism. She showed little if any signs of mental development, being unable to express her wants, except for two sounds interpreted as " pa " and " ma." She seemed to understand in a measure what was said to her. She would sit all day without crying or laughing or attempting to enter into the play of her brothers and sisters, but at other times was irritable and nervous and easily frightened by strangers. She still wore diapers and required constant care and attention. Treatment was begun May 17, two grains of Armour's desiccated thyroids being given three times a day. This caused thyroidism, and the dose was finally diminished to two grains once a day. Her health at first appeared to fail, but improvement in bodily and mental condition set in. In June, 1899, the height was increased to 38 inches and the expression was that of an intelligent child of perhaps 4 or 5 rather than 6 years. Her younger sister, who a year ago was vastly her superior in mental development, is now barely her equal, if not her inferior. The cretin is now a bright, vivacious child, taking an interest in and talking about everything around her, does not require more than ordinary attention. has given up wearing diapers and attends to her own wants in that respect, and assists in the care of her two younger sisters. She has lost most of her timidity. The thickness of lips, nose, eyelids, and tongue has entirely disappeared; and although she does not yet look quite right, one would never suppose that she was a cretin. The prominence of the abdomen and the umbilical hernia have also disappeared. and the disproportion between the limbs and body is not noticeable. She has lost almost all her subcutaneous fat, and the new growth of hair is fine, silky, and easily kept in place. The photographs accompanying this article show a striking change, fully bearing out the author's description of the marked improvement in the case.

Dentition Fever.—Emmanuel Bottone[4] states that this affection is the result of the association of two elements. nervous and infectious. As to the first, the elevation of temperature is due to excitation of the dental nerve branches, which through the trigeminal is transmitted to the thermic centres. This appears to be demonstrated by the fact that, following a considerable rise of temperature, we have a hypothermia in contrast with, and the consequence of, the primary hypothermia (weakening of thermic centre by primary excitation). In the second case the infection causing the dentition fever is situ-

ated in the alveolar process. Moreover, at the moment the teeth are about to develop they uplift the mucous membrane of the gums, wear it and finally tear it, this traumatism aiding in the absorption of the microbes and of their toxins contained in the buccal cavity. Vignal has found in the dental tartar and duct of the sublingual gland eighteen different kinds of micro-organisms, of which seventeen have been isolated; three were micrococci, thirteen bacilli, and one a vibrion.

The fever is subject to marked oscillations, which occur many times in the twenty-four hours, a child being intensely feverish at one moment and the next almost normal. It may occur along with some other febrile condition, may simulate it, replace it, or come on during convalescence from it. The children make grimaces, grind their jaws, and have great salivation, restlessness, insomnia. They carry their fingers and other objects constantly to their mouth, and refuse food because of pain in the gums. Appetite returns as soon as the fever falls. The local complications consist of gingivitis, dental abscess, adenitis, stomatitis, angina. Reflex accidents are cerebral symptoms, convulsive movements during sleep, convulsions occurring in the waking hours. There may be laryngeal, pulmonary, gastro-intestinal, cutaneous, and general complications. Diagnosis is made chiefly by exclusion, by the elimination of all febrile conditions which are likely to attack a child in full health, and by an examination of the mouth. Treatment should be addressed to the fever and to its complications. Baumel gives warm drinks of rice water if there is diarrhea, of barley water if the child is constipated. This, by moistening the tissues, diminishes inflammation. It favors renal and cutaneous elimination of noxious substances which would otherwise accumulate in the blood and might cause uremia. He also advises emollient or slightly astringent applications to the gums. Bone teething rings can be used, but rubber is so easily heated that it still further irritates an inflamed gum. Crucial incision of the gum is unnecessary and facilitates infection. Pin-point white spots covered by a transparent skin can be removed by the finger nail rendered aseptic. The mouth should be rinsed or washed with borated water. Accidents and complications should receive appropriate treatment.

Dermatomycosis Tonsurans, Case caught from a Dog.—Wechselmann[5] demonstrates a case in which a child became infected with the disease, which the dog he played with had had for about six weeks. The dog was a rat-catcher and may have caught the dermatomycosis from rats. In the child the first lesion appeared on the neck and spread to the chest, back, arms, and scalp. Both in the dog's hairs and in the child's, mycelia and conidia of the tricophyton fungus were demonstrated by the microscope.

Diphtheria.—W. F. Matson[6] reports a number of cases and reaches the following conclusions: 1. That with our present knowledge of life habits and rôle of the Klebs-Löffler bacillus

and pathology of diphtheria, the use of serum therapy is not empiricism, but is eminently prophylactic in immunization; decidedly correct as to therapy, in conserving the patient's vital powers and lessening the time when heart, kidneys, and other organs are liable to a lesion. 2. That early administration renders further treatment, except ordinary cleanliness, unnecessary, unless very virulent in type. needing a second inoculation. The earlier the diagnosis is made the better the results expected, almost all adverse reports coming from delayed use and timidity in dosage. One should calculate adult dose at 1,000 units, and make deductions therefrom as to age, weight, and general build of patient, and virulence with toxemic developments and the possibility of a repetition of dose; one is inclined to use greater than the maximum dose in a forlorn hope. 3. That immunization is a fact, not a theory, as the vast number of reports continuing to swell statistics testify. Baginsky, of Berlin. places limit at three weeks, and that seems to be agreed upon. 4. That the dangers attending administration are over-estimated by many. It does not produce a nephritis in diphtheria, as one of the diagnostic points is albuminuria. We can, however, by limiting disease, lessen period of irritation, blood pressure, and moderate febrile curve; this surely will minimize many sequelæ.

Epistaxis.—Carl Seiler [7] enumerates the various causes of nosebleed. which he divides into acute and chronic traumatic and general and local symptomatic. As to treatment, he observes that in order to aid Nature in curing pathological conditions, we must seek for the cause and. if possible. remove it; and therefore, when a case of epistaxis presents itself, whether of a mild (dropping) form or of a more serious (running) one, it is his experience that the best way to proceed is as follows: First arrest the hemorrhage by compression, either with the fingers tightly clasping the alæ of the nose, or, better, with a nasal clamp of his device, keeping the head of the patient slightly inclined forward. All constriction of the neck should be removed. The external compression is made with a view to the formation of a clot, and is preferable to plugging by the insertion of styptic cotton or lint into the anterior nasal chamber. because the compression can be removed as soon as the clot is formed. While the clot is forming the clinical history of the case can be taken. If the bleeding is symptomatic a general examination will indicate the proper treatment; but a careful examination of the anterior and posterior nasal cavities is still of great importance, as it enables us to locate the source of the hemorrhage and apply the necessary local remedies to prevent a recurrence of the symptoms. The best way is to let the patient expel the clot by gentle blowing, without using a handkerchief, and then to insert a self-retaining nasal dilator into the vestibule and illuminate the anterior nasal cavities by a strong light from a head reflector. If the flow of blood is so great as to immediately obscure all the parts. a plug of absorbent cotton saturated with a four per cent solution of cocaine is inserted

and allowed to remain in the nasal cavity for a few minutes, when on its withdrawal an unobstructed view can usually be obtained for a short time. If, however, the cocaine does not produce the desired effect, the examination must be made by the sense of touch, and preferably with the finger if the nostrils are large enough to admit it; if not, a probe skilfully introduced will usually give us the necessary information as to the location of the bleeding spot, and its cause, if local. In the majority of cases of so-called spontaneous epistaxis, the hemorrhage proceeds from a more or less extended ulceration, together with marginal granulation tissue, the vessels of which, having no walls, are non-contractile and when once opened allow a constant and copious oozing of blood into the nasal cavities. In such cases the author has found that thorough curetting of the ulcerated spot is advisable until healthy, non-infiltrated tissue is reached, when the natural contractility of the normal vessels will close their free openings and the nasal hemorrhage will stop. As a precautionary measure he is in the habit of covering the curetted surface with a plug of spunk. such as is used by dentists, or, if this be not obtainable, by a piece of ham fat or lean bacon. Cotton or lint, or any other fibrous substance, with or without astringents, should never be used for plugs to arrest nasal hemorrhage, as the fibres become too closely adherent and tear open the newly formed tissue on removal of the plug. For a similar reason iron in any form should never be used, because it forms a tightly adherent, sandy mixture with the blood, which cannot be removed by washing out the nasal cavities, and has to be removed with forceps, which sometimes causes a return of the epistaxis. All foreign bodies, rhinoliths, polypi, or posterior hypertrophies should be removed then and there, and the bleeding spot attended to afterward.

Erasion versus Excision of Tuberculous Joints in Childhood.—A. Ernest Maylord [8] gives in detail the description of operation and remote results thereof in 26 cases. The conclusions he reaches are the following: In the first place, he says, we must remember that we are dealing with a disease the very nature of which it is at all times difficult to gauge. While it may seem to be purely local in its manifestation, it may equally possess a far-reaching constitutional basis. For this reason it is difficult to speak except in the most general way. What operations should be performed, when and how, are questions that can only be answered in the face of each individual case. One guiding principle, however, touches every case, namely, that the operation must have as its primary object the total removal of the disease. To effect this, however, is frequently to disregard all conventional and classical methods of making skin excisions for the excision or erasion of a joint. Cuts must be freely made in any and every direction, in order to get thoroughly at the infected parts. It is only by these free incisions that secreted pockets of tubercular material are discovered. Diseased tissues should, as far as possible, be *cut* away and not scraped away. As regards the knee and

elbow, the author's practice is to make his incisions for the opening of the joint as seems likely to give him the best exposure. and he does not hesitate to extend these or to make fresh ones if there is the slightest indication that by so doing he can better cut away the disease. In erasions, after all the diseased tissues have been methodically excised, any pockets or spaces left are stuffed with sterilized gauze. all bleeding vessels having, of course, been previously secured. The skin incisions are stitched up to a variable extent, and the limb fixed by simple splints in the required position—in the case of the knee, straight; in that of the elbow, at an obtuse angle. If the temperature keeps normal and there is freedom from pain, nothing should be touched for a week, ten days. or even a fortnight, when the stuffing is removed and properly applied pressure substituted. In the case of erasion of the ankle joint, in the majority of the author's cases. the joint was exposed by an anterior incision extending across the articulation from one malleolus to the other: other incisions were made afterward to expose sinuses or pockets extending usually up the leg. After dividing the skin and subcutaneous tissues the tendons are picked up and secured by stitches in such a way that after division, and at the conclusion of the operation, they can be easily reunited. Attention to this comparatively small detail will save a great deal of trouble in seeking for the retracted tendons when they are subsequently required for reunion. A study of the author's cases collectively brings out the remarkable fact that in not a single instance was the growth of the limb interfered with by erasion, while variable degrees of shortening followed in every case of excision. Another striking fact. not altogether easy of explanation, was the diminution in size of other parts of the limb other than those directly associated with the diseased or operated-upon region. This fact was not noted in every instance, but in such as were examined it was found that the want of development showed itself in the cases of excision and not erasion. The natural and perhaps most likely explanation would be functional inactivity; that parts grow in proportion to the function they have to fulfil. Yet in both cases of excision of the elbow, when there was good flexion and extension, the hand of the affected side was markedly diminished in size; while in the only two cases of erasion in which it was noted, when there was complete ankylosis at the joint, the hands were practically the same in size on both sides. If functional activity be the true cause of this want of development, then it would serve to indicate that an erased ankylosed elbow gave a more serviceable and useful limb on the whole than an excised movable one. In conclusion, in expressing an opinion as to the best operation to perform upon tuberculous joints in children, the author unhesitatingly advocates erasion in every joint where it can be executed, and the younger the child the more imperative the practice. In the case of the shoulder, he sees no reason why this joint should not be erased by turning the head well out of the

socket. But the disease must be limited, otherwise it is im- possible to get room enough to cut it out without excising the head. With the elbow, care must be taken to fix the limb, at the time of the operation, in the position required, should firm ankylosis occur—that is, at an open angle of about 130 degrees. As regards the knee, prolonged care is required to prevent sub- sequent flexion. This is best combated by the comparatively frequent reapplication of a plaster splint. The firmness of the ankylosis seems to determine chiefly the tendency or not to flexion. So long as the tendency to flexion lasts, so long must the limb be kept forcibly straight. With the ankle, the only precaution necessary is to prevent the patient from too soon making use of it. Freedom of movement will come readily enough when the child once begins to get about, but to allow it to attempt to walk before the deep parts are soundly healed will be only too likely to light up some fresh foci of disease.

Icterus, an Epidemic of.—M. Fringuet[9] reports 7 cases of infectious epidemic icterus in children who, although they did not live in the same village, attended the same school. It was of an extremely benign nature. The youngest child was 5 years old and the oldest 13. They had all been in good health previously. The cause of the trouble is unknown. The season had been a dry one; as to the water, the patients drank from several different wells, two of them in a village more than a mile away. The children affected all belonged to the same class in the school. The symptoms were similar in all the cases, the onset being characterized by general weak- ness, loss of appetite, digestive disturbances, occasionally nausea and vomiting, epistaxis. Constipation was found in 3 cases. The tongue was only slightly coated and was moist. The jaundice appeared four or five days after the onset and was not intense. The liver was always hypertrophied and sometimes painful upon pressure. The spleen was somewhat enlarged. There was a polyuric crisis in 1 case and pains in the leg in 1. In 3 cases there was slowing of the pulse, which went down to 55 in 1, and was only 58 when Gmelin's test failed to reveal any more pigment in the urine. The icterus was the last symptom to disappear, but was quickly reabsorbed. Treatment consisted of a saline purgative at the onset, two doses of calomel toward the termination, salol internally, salts of Vichy, milk, barley water.

Nephritis, Acute.—G. A. Himmelsbach[10] reports a fatal case in an infant of 14 months. He learned that the child had been absolutely breast-fed until two months before, when the natural food supply had become insufficient and a modified preparation of cow's milk was given besides, consisting of pure cow's milk, crystal water, cream, and saccharin; on the Thurs- day preceding the physician's call the breast supply was com- pletely cut off, and after that the child was exclusively fed on the modified cow's milk. After death the urine from the bladder was examined and found to contain much albumin and many renal casts. In searching for the probable cause of the

nephritis the author recalled the fact that saccharin had been used as a sweetening agent in the food. From a study of its chemical and physiological properties, it is evident that saccharin is taken into the alimentary tract, absorbed as saccharin, and eliminated from the kidneys as such. If such is the case, then a prolonged administration of this chemical produces a harmful and injurious effect upon the renal cells, for upon these cells is thrown the whole burden of elimination. Himmelsbach's theory is that saccharin was responsible for the renal degeneration in the case reported. The discoverer of the substance, Prof. Remsen, said in a personal letter to the author: "Whether the more delicate organism of a young infant is more susceptible to its action than that of an adult is a question that I cannot answer. I think that it is quite conceivable that it might do harm in such a case. If any one had asked me whether it is advisable to administer saccharin to infants, I should have expressed a doubt as to the advisability of so doing, simply because I do not think we know enough about the action of this material. It is said to pass through the system unchanged, and evidence has been furnished in cases of adults that this is the truth; but that indicates the possibility of its acting as an irritant in some parts of the body, and even a slight irritant might be a very serious matter to a young infant." A few suggestions are commended to attention: 1. The cause of death was acute parenchymatous nephritis, as proved by the analysis of the urine and examination of the kidneys. 2. The prolonged administration of saccharin contributed toward, if it was not entirely responsible for, the renal degeneration. 3. In all cases of infants' diseases, whether the diagnosis is perfectly clear or obscure. the urine should in every instance be examined.

Pertussis.—Edward F. Willoughby [15] has for twenty years relied upon chloral hydrate in the treatment of this affection, the youngest infants being tolerant of this drug. Given in such doses and at such intervals (which may be left to the direction of a careful mother) that the child shall sleep, say, half again as many hours as it otherwise would, and be disposed to doze or, at any rate, to lie down from time to time during the day—in fact, to be more or less always sleepy and quiet—the effect is always well marked and often startling, the severest attacks being moderated in a few days and the illness thenceforth pursuing a favorable course. With very young infants. in whom the asphyxia and cerebral congestion induced by violent and prolonged paroxysms lead to convulsions, a few double doses given in closer succession completely obviate the danger. The effect of chloral as nearly approaches the character of a specific remedy as can well be imagined in a specific disease that must run a definite course. In some cases it may be useful to combine a bromide with the chloral, and of late years the author has found its action greatly aided by combining it with antipyrin—chloral, antipyrin, and vin ipecac with syrup being his favorite formula.

Vaccination.—Louis Lofton,[19] in preparing an arm for vaccination, uses nothing but a clean towel dipped in cold water. After briskly rubbing the part he dries it with another towel, scarifies, and deposits the virus as follows: Only the extreme outer integument is penetrated, if possible drawing *no blood*. The part is held taut with the index finger and the thumb and lightly scarified with a needle-pointed bistoury in various directions, making the place not larger than a quarter of an inch square. Then the skin is released that the serum may flow. This is wiped away with a clean, dry towel, the original position is resumed, and while the skin is taut the virus is deposited and rubbed in well with the scarificator and vaccination is done. In this way the place dries very quickly, the sore is confined to a small area, the inflammatory process is decidedly lessened, the absorption is more equalized and gradual, and the prodromal symptoms are reduced to a minimum. The author has never had an untoward result after preparing the proposed seat of inoculation as outlined. Virus suspended in glycerin and put up in capillary glass tubes will remain potent indefinitely. Vaccine shields should be used early; they prevent extensive inflammation, especially the felt splint which the author recommends on account of its flexibility, durability, applicability, and cheapness. Children may often be successfully vaccinated while asleep. Ivory points deserve to fall into disuse, for their use is often barbarous. The capillary glass tube is an ideal preservative of the virus.

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ITEMS.

THE meeting of the Southern Surgical and Gynecological Association will be held in New Orleans, December 5, 6, and 7, under the presidency of Dr. Joseph Taber Johnson, of Washington. Members of the medical profession are cordially invited to attend.

DR. JOHN G. CLARK, of Philadelphia, late of the Johns Hopkins Hospital, and well known to the readers of this JOURNAL, has been appointed to fill the chair of Gynecology at the University of Pennsylvania.

ORIGINAL COMMUNICATIONS.

FATAL PERFORATION OF A UTERUS PARTIALLY ATROPHIED POST PARTUM:

A MEDICO-LEGAL CASE.[1]

BY

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(With two illustrations.)

CLINICAL HISTORY AND HISTORY OF THE SUIT.

THE case to be reported in this paper is of great interest because of its clinical history, the pathological changes responsible for the accident, and the medico-legal questions involved. The pathological examination was of the utmost importance, because it cleared up what would otherwise have been a very obscure case. The result of the trial emphasized again the important legal principle that the law presupposes a physician to be skilful and not negligent unless the contrary be proved.

[1] Read before the Illinois State Medical Society, at Cairo, Ill., June 16-18, 1899.

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Briefly, the case was as follows: Drs. Wight and Landon, of New Hampton, Iowa, performed the operation of curettement of the uterus on a patient, and twelve hours after the operation she died. A very incomplete postmortem examination made three days after death disclosed a perforation of the uterus. A civil suit for damages on the ground of malpractice, brought by the administrator of the estate of the deceased, was tried before a district court of Iowa, Judge Fellows presiding. After hearing the case for the plaintiff the jury was instructed to render a verdict for the defendant.

The clinical history as furnished by Dr. Wight, the operator, and not overthrown by the relatives and friends of the patient, shows that the patient, Mrs. D., 21 years old, wife of a farmer, a strong, previously healthy, well-built woman of German origin, was delivered of her first child August 12, 1897. The history of the labor and childbed is lacking, except that she got up about two weeks after her confinement and afterward performed the usual duties of housewife. Dr. Y., the physician who attended her in her confinement, was, as it appears, very much interested in the suit and was generally credited with its instigation. This was because the relatives of the patient had charged him with responsibility for her illness on account of alleged negligence or want of skill shown during labor.

The friends of the patient testified that after the labor she had occasional pains in the abdomen, which did not, however, prevent her doing the work of the house, and on one or two occasions going to parties and dances. According to Dr. Wight's history she complained of a vaginal discharge, at times quite profuse, very free and prolonged hemorrhage at the time of menstruation, considerable pain in the back and especially in the abdomen. The physical examination disclosed a free leucorrhea, a large, soft, tender uterus, a cervix lacerated and patulous, admitting the finger to the internal os, and no apparent trouble with the appendages. This examination was made in February, 1898, about six months after the confinement. The patient had come a distance of eighteen miles to consult Dr. Wight. He recommended hot vaginal antiseptic douches and proper medication. She returned in about one week without satisfactory improvement. He then advised a curettement, endeavoring to explain its object to the patient by suggesting that there was something unhealthy in the womb, perhaps resulting from a piece of afterbirth which

was left in the uterus at the time of confinement. The operation was performed March 2 under chloroform anesthesia. After the usual disinfection with 1:5000 sublimate solution, an examination was made and the cervix found so dilated that it seemed possible to introduce the finger into the uterus. The cervix was held with volsella forceps and a Goodell dilator introduced and opened without the expenditure of force. A large, round, dull curette, about one inch in diameter, was then introduced and the curetting begun on the right side. When the left side of the uterus was reached, very moderate force being employed, a mass about the size of the terminal phalanx of the finger or thumb was dislodged and brought away. The operator held this mass to be a piece of the placenta and probably responsible for the patient's trouble. The tissues in the neighborhood feeling soft, Dr. Wight very carefully made two or three movements more with the curette and completed the operation by washing out the interior of the uterus with a pint of 1:5000 solution of sublimate, all of which seemed to return, and then lightly packing with iodoform gauze. The patient was put back to bed in good condition, having taken the anesthetic well. The physicians remained until she was so far recovered from the anesthesia as to be able to speak, when she complained of a little pain, for which Dr. Wight gave a hypodermatic injection of morphine.

The operation was performed in the country at the home of the patient's mother, nine miles from New Hampton. In the course of the afternoon a telephone message was sent to the doctor informing him that the patient was vomiting but was not in special pain. Dr. Wight returned proper directions. It was brought out in the trial that the patient slept considerably for three or four hours after the operation; later she complained of some pain. At 8 o'clock in the evening, about nine hours and a half after the operation, she nursed her child. The condition of the patient was apparently not considered alarming, for the husband and most of the other relatives went to bed in the evening. About fifteen minutes before death the patient became much worse, had difficulty in breathing, and frothed at the mouth. The symptoms rapidly grew worse, and the patient died twelve hours after the operation.

The animus of the suit has been already indicated. The physician who had attended the patient in her confinement, smarting under the implication of improper management of labor, the origin of which he mistakenly understood was due

to Dr. Wight, instigated an inquest before a justice of the peace. Two other physicians were called, who made the postmortem examination, the results of which will be given below. The alleged finding of the perforation of the uterus led to the institution of the suit. The case came to trial May 2, 1899. According to the opening statement of the prosecution, the plaintiff would prove that the operation was unnecessary; that it was done in such an unskilful manner that the injury resulted which led to the death of the patient; that because of negligence and lack of skill the injury was not recognized and properly treated; that dangerous chemicals were used; and that the patient was neglected after the operation.

In the testimony introduced nothing was said about the use of any chemicals. This charge was supposed to refer to the sublimate solution used in the injection. If the prosecution at any time had the intention to make use of this claim, they had either given it up or expected to establish it by the testimony of the operator himself. It is, however, impossible to see how they ever could have succeeded in this, because, first, all of the experts of the plaintiff held that the patient died of shock. Second, the symptoms brought out were not those of sublimate poisoning. Third, the kidneys were found healthy. Moreover, the small amount of solution used in the uterus, about one pint of a 1:5000 solution, all of which apparently came away, made the idea untenable. The fluid found in the abdomen at the postmortem was thrown away and not examined, according to the testimony, hence this claim was necessarily abandoned.

The first claim, that the operation was unnecessary, according to the statement of the judge, was legally the most important, and the failure to establish it was the chief reason why the prosecution lost its case. They attempted to establish it, first, by testimony tending to belittle the importance of the symptoms for which the patient had consulted Dr. Wight; and, second, by the testimony of the physicians who examined the uterus post mortem and claimed that its condition was normal and did not indicate an operation. The fact that the patient was able to do her housework, and even attend a party in January and dance, was not inconsistent with the presence of a serious pelvic disease, as every physician must admit, and as was proved to the court simply by her act in making a long journey to consult Dr. Wight. The assertions of the physicians who made the postmortem examination three days after

death, that the interior of the uterus showed no pathological condition that would call for curetting, were equally valueless, first, because a macroscopic examination after curettement could not be expected to disclose the condition that was present before the operation; and, second, because it was manifestly impossible for the operator to make an ocular examination of the interior of the uterus before the operation, and hence he could only base his treatment upon the history of the case, the symptoms, and such physical examination as he could make. For the latter reason even the testimony of the expert pathologist, who was called by the prosecution, had no especial value or influence on the result of the suit. This expert testified that he found in specimens taken from the uterus, from regions immediately adjoining those examined by one of us (Herzog), that the wall of the uterus was nearly normal, the cells staining fairly well with the hematoxylin-eosin stain. The cross-examination brought out the fact that the examination had not been very thorough and that none of the more important staining agents for showing specific pathologic changes had been used. The defence had no opportunity to examine the microscopic specimens of the plaintiff's expert, but the unquestionable character of the specimens prepared by one of us (Herzog) permits us to disregard the negative results of the former. The results of our own examination had, however, no influence on the trial, because, as stated above, the case was taken from the jury when the testimony for the prosecution was ended, before any evidence was given for the defence. Hence, admitting that the testimony of the pathologic expert of the plaintiff was unimpeached and his findings correct (which, as will be seen later, they were not), it had no effect on the case, for the reasons given above.

The prosecution endeavored to make a great deal of the alleged statement of Dr. Wight to the patient that a piece of retained afterbirth was the cause of the trouble and its presence the indication for the operation. As stated before, this was given as one possible cause of the trouble, simply because it could be easily understood by the patient and perhaps make the necessity for the operation more apparent. The prosecution endeavored to show by its experts not only that no evidence of afterbirth was found in the uterus after death, but also that it would be impossible for any to remain in the uterus for so long a time—six or seven months. That the plaintiff's experts should give a positive affirmative answer to the latter proposi-

tion can be explained only on the ground that they did not have in mind the investigations of Küstner and others on decidual polyps or decidual endometritis, nor the more recently described tumors of placental origin, the syncytiomas.

In the preparation of the case for the defence, we suggested to their attorneys that they need only establish the fact that the operation was indicated, for the pathological examination showed such a condition of the uterus that a proper curettement could hardly have been made without causing a perforation. The case was even easier than we suggested; it was not necessary for the defendant to prove that the operation was indicated, because it was essential for the prosecution to prove that it was not indicated. Thus was affirmed the important principle that the law presumes that the physician is the best judge of the treatment that is necessary in any given case, and that he is competent and skilful unless the contrary be proved.

The plaintiffs evidently thought to establish their second claim—that the operation was done unskilfully—by proving the fact of the perforation of the uterus. This fact was not quite established beyond doubt; one of the members of the coroner's jury testified that after the uterus was removed from the body and cut open and held to the light there was a thin place in the uterus, but not a hole. This evidence can, however, be disregarded, as it conflicts with that of the physicians who made the postmortem examination. From their evidence it seems that after the intestines were removed from the pelvis and the uterus grasped and held up, either a thin place or a hole was found in the posterior fold of the left broad ligament a short distance from the uterus. Through this place the finger was passed into the uterus. This manipulation may have actually made a hole in the peritoneum. If, however, the hole was really present, the introduction of the finger was probably responsible for the fact that this opening was so much larger than that in the interior of the uterus, as will be seen by the detailed description of the removed uterus.

It certainly cannot be affirmed that the perforation of the uterus is in itself evidence of lack of ordinary skill, for the accident has not so very infrequently happened to the best operators. It is generally associated with some pathological condition of the uterine walls. Of course there is no object in curetting a perfectly healthy uterus. In this case our examination explains the cause of the perforation; but it is improper to speak of perforation in this case, as the term implies a

forcing or boring through the uterine wall with an instrument. Here both the history of the operation and the pathological examination show that the hole was left in the uterine wall by the removal of the sequestrum, that had been separated by necrotic processes.

The next contention of the prosecution, that Dr. Wight should have known of the so-called perforation and have treated it accordingly, perhaps thus preventing a fatal issue, is a very interesting point for the surgeon. Three questions are involved: 1. Should the operator have known of the hole ? 2. Should he have treated it differently ? 3. Would the result have been changed by a different method of treatment ?

To take the last two questions first: What was the cause of death ? The theory of the prosecution was that death was due to shock. In the absence of a complete postmortem examination, especially an examination of the chest contents, the cause of death cannot be definitely known. The postoperative symptoms, however, seem to point much more to embolism of the pulmonary artery. The cause of death was certainly not hemorrhage nor sepsis. Would any other method of treatment have prevented the fatal issue ? Experts for the plaintiff stated that the correct treatment would have been to open the abdomen and sew up the hole. This is a statement that is not supported by the general experience of the profession, and it is difficult to see how it would in this case have controlled the shock, supposing that to have been the cause of death, or prevented the embolism. The first operation that would probably occur to most surgeons would be hysterectomy, especially in a case like this where there had been " septic " discharge for a long time and when a perforation would have led to the suspicion of malignant disease. It is not impossible that hysterectomy would have prevented the fatal result, for the embolus was very probably not dislodged into the blood stream at the time of the curettement. Yet, in the absence of symptoms at the time of the operation in the case of a young married woman, it is safe to say that nine men out of ten, even if they had discovered a hole, would have done just as Dr. Wight actually did—tampon the uterus lightly and leave the case to Nature.

This discussion has, however, no bearing, because the hole was not discovered, and we must simply answer the question, Should he have known of its existence ? In many books and journal articles the statement is found that perforation should always be discovered. When an instrument is pushed through

the walls of the uterus into the abdominal cavity, the fact is known by the depth of the penetration of the instrument or by feeling it underneath the abdominal walls. Here it is probable that the curette never passed outside of the uterus, and the operator seems quite excusable for not having recognized the injury.

Concerning the last point, that the operator neglected the patient after the operation in not visiting her, the evidence was conclusive that the telephone message sent by the husband was to the effect that the patient was vomiting but was not in much pain. Vomiting after anesthesia is so common, particularly when, as in this case, the patient had, contrary to orders, eaten a breakfast, that probably no physician would regard it as a reason to make a visit.

It is very fortunate for the profession that the trial was brought, since it has led to the careful examination of this rare case that would have otherwise remained a mystery. We have every reason to believe that the defendants managed the case just as every conscientious physician would have done and would again do in a similar case, and they are to be heartily commiserated at the unfortunate result of the operation. The unprofessional conduct of the colleague who instigated the suit was rightly rewarded by its complete failure.

The subject of the diagnosis and treatment of these cases of necrosis and eccentric atrophy of the uterus is extremely interesting and important. If, by way of supplement, we should add a word on this subject, we would suggest that perhaps the cases are not so extremely rare as might be inferred from the fact that so few have been recorded. Destructive processes resulting from the postpartum growth of myxomatous villi, often leading to the perforation of the uterus, have been described, and also hemorrhagic infarcts due to lateral embolism or thrombus, leading to characteristic necrotic changes. Likewise desiccating metritis resulting from traumatisms of labor is well known. But a deep necrosis extending nearly or quite through the uterine wall, discovered seven months post partum, evidently associated etiologically with a chronic infective process, has not been described so far as we know. More or less necrosis of the endometrium and of the adjacent muscularis, of infective origin, is of course not rare and has been well described by Dittrich. Whether such a condition as we have found in this case may not exist more frequently than has been suspected, and may not, indeed, explain some cases of

perforation of the uterus, is a question worthy of consideration.

With regard to the diagnosis of such a condition as existed here, we would call attention to the value of digital exploration as furnishing the surest and safest method for differential diagnosis. From the history it seems probable that it could have been employed in this case, as the cervix was open. If the possibility of the occurrence of a circumscribed necrosis were kept in mind, one could probably discover it with the finger and institute a satisfactory therapeusis.

With the discovery of the nature of the pathological condition hysterectomy would seem to be the operation indicated, because of the danger of any other operation and the risk of spontaneous perforation.

THE LITERATURE ON PERFORATION—PATHOLOGIC EXAMINATIONS.

Perforation of the uterus, either by sound or curette, is by no means a very rare accident. All authors reporting cases and giving a résumé of their views concerning the subject are agreed unanimously upon the fact that the greatest liability to this accident exists when curettement is performed post partum or post abortum. When curettage is made at this time the indication for it is, as a rule, the retention of placental tissue, which, if it has been *in utero* for any length of time, tends to bring about decidedly pathological changes. These latter are most profound and most liable to establish conditions favoring a perforation by sound or curette when puerperal infection supervenes. The extensive investigations of Dittrich,[1] made on 92 uteri post partum, have clearly demonstrated this point, and shown that in puerperal infections and others occurring after delivery the uterus becomes excessively soft—a condition which may persist for months, particularly in such cases where extensive degenerative changes are found in the muscular coat of the uterus and in the media of the uterine vessels. The necrotic tissue present favors, of course, a perforation, which, as Dittrich states, may, after the absorption of the necrotic tissue, also occur later on in consequence of the thin, poorly resistant places left. The condition we then have to deal with is that of atrophy of the uterus. In considering this pathological change we are, of course, not concerned in the normal lactation atrophy of the uterus (hyperinvolution during lactation), from which the organ under normal conditions recovers after lacta-

tion, nor in the normal senile atrophy, nor in that brought
about artificially by castration, nor in that congenital condi-
tion called hyperplasia uteri (Virchow). Atrophy of the uterus
has occasionally been observed in some chronic general diseases,
such as pulmonary tuberculosis, diabetes, leukemia, chlorosis,
pernicious anemia, Addison's disease, Basedow's disease, myx-
edema, nephritis; also after such acute infectious diseases as
scarlatina, typhoid, articular rheumatism. Of the local affec-
tions which lead to hyaline and necrotic changes of the uterine
muscularis and its blood vessels and to atrophy, there is none
more important than puerperal infection. Observations like
those made by Dittrich (*l. c.*) have also been made by a num-
ber of other investigators. Ries,[2] for instance, has examined
some cases of extensive atrophy of the uterus following puer-
peral infection, where he found absence of the mucosa, hyaline
degeneration and thrombosis of vessels, degeneration and
necrosis of the muscularis. Such atrophies have also been
noticed following very difficult labors and severe lesions of the
uterus during parturition (Gottschalk[3]). Döderlein,[4] who con-
tributes the article on "Atrophia Uteri" to Veit's "Handbuch
der Gynäkologie," divides this pathological condition into two
groups: the concentric atrophy, in which bimanual examina-
tion reveals a very hard, small corpus uteri, which, when
examined with the sound, measures four to five centimetres;
and the eccentric atrophy. In the latter condition the cavity
of the uterus is not reduced in size, but it may on the contrary
be large and roomy; the wall of the organ, however, is thin and
flabby (uterus membranaceus). The consistence of the mus-
cular coat may be so much reduced that it is difficult or impos-
sible to find the uterus by bimanual palpation. In this class
of cases the softness (marcidity) of the muscularis, Döderlein
states, brings with it the danger that the entering sound will
not find any appreciable resistance, and will perforate the wall
even if introduced with the greatest care and tenderness. The
subjective symptoms of atrophy of the uterus are vague, and
the diagnosis, according to Döderlein, can only be made by
bimanual examination and by the menstrual history. As to
this latter, the author named says that atrophia uteri (the state-
ment refers to both varieties) is accompanied by scanty men-
struation or amenorrhea. This latter statement, however,
cannot be accepted unqualifiedly, because in the case report-
ed in this paper, which belongs to the eccentric variety, there
was present a decidedly increased, long-continued menstrual

flow. This condition may perhaps be the rule in the early stages of eccentric atrophy.

It is, of course, particularly the eccentric variety of uterine atrophy in which, in consequence of its intrinsic nature, perforation of the wall by the sound or curette may easily occur and has quite often occurred. A search of the literature on perforation of the uterus shows that in very few cases has there been made a thorough microscopic examination, and the minute morbid condition can in most cases be inferred only from the clinical data given.

Sir James Y. Simpson himself must have seen cases of uterine perforations by the sound, because he lays stress upon the fact that one should be mindful of the occurrence of this accident in the use of this instrument. Already a few years (in 1854) after the introduction of Recamier's curette, Richard (quoted from Pichevin, see below) reports a case where a uterus had been perforated by a curette used "*facilement et avec grand douceur*," and states that this accident has already occurred several times. Dupuy[5] in 1873 was able to tabulate 17 cases of perforation of the uterus with the sound. In none of these 17 cases, however, did the accident prove fatal. Haynes[6] twice perforated the uterus with the curette. Both cases recovered, as well as the third case quoted by this author which Hofman reported to the Philadelphia Obstetrical Society, April 3, 1890. In both of Haynes' cases the uterus was very soft; in one of the cases there existed an endometritis fungosa. Lanelongue[7] twice encountered the accident, once followed by death. In Lanelongue's fatal case the curettage was made in a woman 34 years old, IVpara, for endometritis. Lanelongue did not notice any special incident or accident during the operation of scraping, but when after it he injected a sublimate solution he noticed that the fluid did not return. He now suspected a perforation, cleaned out the cavity well, and amputated the cervix. During the night after the operation the patient vomited frequently, and on the next day a stomatitis, diarrhea, and albuminuria developed. On the nineteenth day after the accident the patient died. The autopsy showed a uterine cavity full of pus, a perforation in the right upper corner of the fundus, and an accumulation of pus in the peritoneum. The other organs, including the kidneys, were found healthy. This patient therefore recovered from the effects of a transitory corrosive sublimate poisoning which left no permanent traces (normal kidneys), but succumbed to the septic peritonitis.

When Lanelongue read his paper on his cases to the Bordeaux Obstetrical Society, Rivière reported a case of fatal uterine perforation in an attempt at criminal abortion.   Auvard [8] says that in 270 curettements made at his clinic during the years 1890 to 1894, he had one non-fatal perforation.   He states as the result of his experience: " It is, however, not the curette, but the dilator one uses first, which produces the perforation." Zinke [9] reports that in curetting he perforated the uterus on three occasions.   All three patients recovered.   Alberti [10] saw a case in which the uterus was perforated in a curettement which was made some time after a suspected abortion.   When an attempt was made to remove the curetted masses from the cavity a loop of small intestine was pulled out of the uterus.   Alberti operated, found and repaired the perforation, and his patient recovered.   The author states that at the place where he found the perforation the muscularis was extremely soft and flabby, and so thin that when he tried to suture it the sutures tore through the tissues, and he finally used four Lembert sutures and the assistance of a fold of broad ligament to close the rent, which was four centimetres long.   Another point which Alberti mentions is that the tissue where the tear occurred must have been very poorly vascularized, because there had not been any hemorrhage from the tear.   When Alberti reported his case to the Berlin Society for Obstetrics and Gynecology, Veit, Gusserow, Orthmann, Olshausen, and Martin each reported a similar case. Four of these latter cases terminated fatally.   Pichevin, [11] in an article on the accidents during curettement, attributes to the curette and not to the dilator the perforation, and says that the latter usually occurs in the neighborhood of the tubal angle, where inflammatory changes are so frequently found.   The greatest danger of perforation, Pichevin thinks, is the fact that it is sometimes overlooked and followed by a copious uterine injection, whereby grave and fatal accidents may be brought about.   Pichevin quotes a case of this kind published by Bonvalot (" Thèse de Paris," 1892), also four cases published by Raffray (" Thèse de Paris," 1893), one of which likewise took a fatal issue.   Lawson Tait [12] once perforated the uterus with the sound, without any bad consequences.   Dumont [13] reports three recovering cases of perforation by the curette.   Dreising [14] describes a fatal case of scraping post abortum.   Flandrin [15] gives an account of two examples where the womb was perforated by the sound.   Mann [16] reports three cases of perforation of the uterus after abortion, with prolapse of the intestine.   Two

of these cases terminated fatally.   Mann also himself once per-
forated the uterus with a Goodell dilator.   Hickman [17] once pro-
duced a perforation by the introduction into the uterine cavity
of a uterine douche tube.   He noticed how excessively soft the
uterine wall was in his case.   Courant,[18] while examining an in-
traligamentous myoma, perforated a uterus first with the sound
and then with the curette.   Gläser [19] with a sound several times
perforated the uterus of a woman who had been delivered three
months previously.   The uterus was then removed by vaginal
extirpation, and the author describes the organ as follows:
"Uterus not large, walls not thickened, fundus as soft as
grease, cervix somewhat more resistant.   When, after the
removal of the uterus, the sound is allowed to stand upon the
fundus, the instrument by its own weight perforates the wall."
Odebrecht [20] reports the following case: He perforated by the
sound the uterus of a woman, 29 years old, five weeks after an
abortion.   When, after a laparatomy, he tried to close the per-
foration and to fix the uterus to the abdominal wall, the sutures
tore through the uterine substance and the operation could
only be finished by passing the sutures through the adnexa.
At the meeting of the Munich Society for Obstetrics and Gyne-
cology, held November 18, 1897,[21] cases of perforation of the
uterus were reported by Krecke, Wertheim, and Theilhaber.
That perforation of the uterus may sometimes occur under what
one should consider very unfavorable circumstances, and still
not lead to any directly dangerous consequences, is proved by a
case published by Henrotin,[22] who reports that a woman about
seven weeks pregnant, in order to bring about an abortion,
introduced a sharp instrument.   It was later on shown, by a
celiotomy which became necessary the fourth or fifth month of
gestation, that the woman had perforated the fundus, the ovum
escaping through the opening made, the placenta, however,
remaining attached partly inside of the uterine cavity, partly
attaching itself to the outside of the fundus and the neighbor-
ing structures.   The only case of perforation where a full
microscopical examination has been made after the accident
took place has been reported quite recently by Kentmann.[23]
The perforation by the sound occurred in a woman 40 years old.
The accident was noticed, and, since malignancy was suspected,
the uterus was at once removed by vaginal hysterectomy.   The
microscopical examination of the uterine wall showed that the
muscle bundles were alternating with interstices often broader
than the muscle tissue itself.   The interstices were filled out

with a coagulated transudate. The muscle fibres themselves showed degenerative changes, the vessels thickening of the adventitia, and other abnormalities. The whole picture was that of a myometritis edematosa.

The above collection of cases quoted from the literature shows that the accident of perforating the uterus by sound or curette has been reported quite a number of times and has in several of these instances led to a fatal issue. The list is probably not a complete one. Even if all cases reported were collected without any omission whatsoever, it would then also represent an incomplete record only, because many cases, perhaps most cases, are not reported at all. As Raffray (*loc. cit.*) somewhat facetiously says: " Nulle doute que les faits de ce genre soient plus frequents qu'on ne le pense, mais comme on le comprend les auteurs n'ont nulle envie de se faire conaître." There are probably also cases in which fatal complications followed a curettement where the perforation was never noticed or suspected. Perhaps in the two cases reported by Jackson,[24] in which after a curettement a fatal peritonitis developed, the cause of the latter may have been perforation of the uterus.

During the trial of the case reported in this paper, testimony was given to the effect that three days after the death of the patient a postmortem was held on the well-preserved body.

This examination was made between the hours of 10 and 11 P.M., in a room lighted poorly by a coal-oil lamp. The physician who, in the presence of two other doctors, held the postmortem, opened the abdomen by a longitudinal section between the lower end of the sternum and the symphysis pubis and a transverse section in the middle of the former. It was stated at the trial that there were noticed on opening the abdomen a purplish discoloration of a loop of intestine, a small amount of serous fluid tinged with blood in the abdominal cavity proper, and a small amount of whitish, probably purulent fluid in the pelvic cavity around the lower part of the uterus. It was further stated that there was seen on the left side of the uterus a perforation. After the physician who made the postmortem had pressed with his finger through the place where he thought he noticed the perforation, the uterus was removed and then opened by a longitudinal incision in the middle of the anterior wall. It was also stated that the kidneys had been removed and found to be normal. The examination was not extended any further. Particularly was there no examination made of the thoracic cavity. According to testimony of the experts for

plaintiff, the uterus, soon after having been removed, was placed in strong alcohol and left there until one of us (Herzog), by order of the court, in January, 1899—*i.e.*, about nine months after the postmortem—had a chance to make an examination of it.   The result of this examination was as follows:

Macroscopic Examination of the Specimen.—The uterus and its appendages have been severed below the os externum of the cervix; the section has been made through the upper part of the vaginal walls.   The separation of the appendages from their connections with the surrounding tissues has evidently not been done with great care, since the appendages are not intact, but more or less mutilated.   The uterus had been laid open by an incision into the median vertical line of the anterior wall.   The cut starts in the fundus and goes through the entire body and cervix.

The measurements of the uterus are as follows: Length from the os externum to the top of the fundus, $6\frac{1}{2}$ centimetres ($2\frac{3}{4}$ inches); breadth between attachments of Fallopian tubes, 6 centimetres ($2\frac{1}{2}$ inches); thickness from before backward in region of middle of body, 3 centimetres ($1\frac{1}{4}$ inches); thickness of uterine wall at corpus, below fundus, 12 millimetres ($\frac{1}{2}$ inch); thickness of wall at ostium internum of cervix, 7 millimetres ($\frac{1}{4}$ to $\frac{1}{3}$ inch).   There presents itself in the corporeal uterine cavity at and near the fundus a tissue which looks spongy and soft, somewhat like softened (macerated) mucous membrane. This tissue at the fundus appears to have a thickness of about 6 millimetres ($\frac{1}{4}$ inch); it thins out gradually toward the cervix and toward the left of the uterine cavity, where the anterior and the posterior walls of the body meet.   The tissue just described has an uneven surface, and the surface irregularities increase toward the os internum and particularly toward the left side.   Here, in the lateral fold or recess formed by the junction of the anterior and posterior uterine walls, the internal surface is especially uneven and there are formed bridges and ridges of projecting tissue.   On the right side of the corporeal cavity the surface is, on the contrary, even and smooth. On the fold of the left side, where the internal corporeal surface presents the irregular, uneven appearance described, there is seen a perforation or opening which is located about $1\frac{1}{2}$ centimetres ($\frac{3}{4}$ inch) below the left ostium tubæ, and which is large enough to easily admit a thick lead pencil or the tip of the small finger.   The perforation takes an almost horizontal (horizontal with reference to the erect body) direction outward

(toward the left side of the body) and backward, goes between
the two folds of the left broad ligament, and makes its exit
through the posterior fold of the broad ligament where this is
attached to the posterior wall of the uterus. This place of exit
of the perforation is situated about 4 centimetres (1¾ inches)
from the top of the fundus. The slit produced by the exit out
of the broad ligament extends laterally toward the ampulla
tubæ. Length of slit, 3½ centimetres (1½ inches). The muscu-
lar substance of the uterus, in spite of the fact that the organ
has been in ninety-five per cent alcohol for several months, is
soft and flabby, particularly on the left side. The left Fallo-
pian tube is over 10 centimetres (4 inches) long; the fimbriated
extremity is torn and incomplete. Most of the left ovary is
missing and what remains is torn and mutilated. On the right
side most of the Fallopian tube and of the ovary have been
torn away. There is found in the cervix what appears to be an
old healed tear. The peritoneal coat of the uterus, as well as
the surface of the folds of the broad ligaments, are smooth.
No fibrinous or fibrous deposits or adhesions can be seen with
the naked eye.

For microscopic examination the following pieces were
taken:

1. From the cervix at the place where there appeared to be
an old healed tear.

2. From the inner surface of the corpus below the fundus.

3. From the periphery of the perforation, taking in all the
tissues from the internal corporeal surface to the peritoneal
covering. The small pieces taken for microscopic examination
were embedded in paraffin, sectioned and stained according to
various methods (Van Gieson, Weigert's fibrin stain, Wei-
gert's stain for elastic fibres, etc.).

The examination of the piece of tissue taken from the cervix,
and supposed to come from a place where there had been a rent
or laceration, shows that this supposition was correct. The
free surface is lined by a single row of, columnar epithelium
which is quite short and of the type of the epithelium lining
the body cavity. A basement membrane cannot be demon-
strated, but the epithelial cells rest, as it appears, directly upon
a tissue composed of fusiform fibrillar connective tissue quite
well provided with sharp-cut, fusiform, or oval nuclei. A very
moderate number of smaller round cells are also found dis-
tributed in this connective tissue, which is well provided with
blood vessels, which are, however, completely empty in the

sections examined. There are no glands, or any remnants of them, in this tissue.

Next to the tissue described follows the muscular coat of the cervix. The muscle fibres are mixed with connective tissue, but the mutual proportion of these elements appears to be that which is normally found in the cervix. The muscularis of the cervix shows thick-walled blood vessels. The vascular endothelium is fairly well preserved in many places; the muscularis of the vessels shows distinct, clear-cut muscle cells; the connective-tissue coat of the vessels does not seem to be increased in thickness. The muscle cells of the cervix are clear-cut and
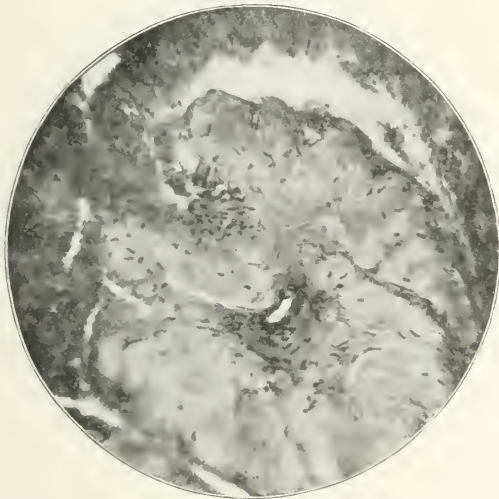
Fig. 1.—Spencer prof. one-quarter inch; oc. one and a half inch. From uterine muscularis near fundus, showing an old thrombus which has become newly vascularized. The new vessel is seen in the middle of the field. (Eosin and hematoxylin stain.)

of the type of normal muscle cells in a non-pregnant completely involuted uterus. The upper margin of the sections—*i.e.*, that part which was nearest to the body and probably already belonged to the corporeal and not to the cervical muscularis— shows decided degenerative changes. The muscle fibres have lost their nuclei; they are in a condition of hyaline degeneration. They either take the eosin stain only or take the nuclear stain diffusely.

Sections from the piece of tissue taken from the inner surface of the corpus below the fundus *do not show any trace of a normal mucous membrane.* The tissue next to the cavity

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shows an irregular fringed surface, as if it might have recently
been curetted. This tissue is made up of coarser and finer
loosely arranged wavy fibres, the interstices between which
are filled out with a granular cell detritus. Between these
elements there are seen round and oval openings. These are
the lumina of completely degenerated blood vessels, in some of
which corpuscular elements may still be recognized. Next to
the tissue just described—*i.e.*, the remnant of a completely
degenerated glandular mucous membrane in which every trace
of glandular elements is absent—there are found muscle fibres
showing evidence of degenerative changes, indistinct nuclei,

Fig. 2.—Spencer prof. one-quarter inch; oc. one and a half inch. From uterine muscularis near fundus, showing a younger organized thrombus. Fibroblasts close the lumen of the vessel. The dark, wavy outlines seen around the thrombus are the elastic fibres of the vessel wall. (Carmine and Weigert's stain for elastic fibres)

complete absence of nuclei. The layer of muscle fibres so
changed is only thin, and in the rest of the muscularis, as far
as removed, the muscle fibres are normal. They enclose what
in the sections appear as roundish or oval masses of a hyaline
material with fusiform cells. These masses are best compared
to the not too old corpora fibrosa or albicantia of the ovary.
They are the changed products of organized thrombi. In some
places these organized thrombi have become vascularized, and
one sees in the middle of the hyaline masses one or two newly
formed vessels. In other parts of the sections the organized
thrombus is of a younger type, and the tissue closing the

former vessel lumen is not a hyaline mass, but consists of fusiform cells (fibroblasts). All these conditions can be beautifully studied by the aid of Weigert's new stain for elastic fibres, which for such purposes cannot be too highly recommended.

Sections from the triangular piece of tissue taken from the site of the perforation do not contain a single intact, healthy cell. Everything is in a state of degeneration. Not a single clear-cut nucleus can be seen. The tissue has generally taken the eosin stain and here and there the nuclear stain diffusely. There are large openings in this tissue, which are, as proved by the elastic fibre stain, lumina of large vessels; their walls are in a complete stage of hyaline degeneration and even necrosis. In the tissue next to the very point where the perforation in the uterus was found, the degeneration was most complete. The inner layer at this place is composed of a mass of fine, loosely interwoven fibres (fibrin, as demonstrated by Weigert's fibrin stain) with granular detritus. The outer layer, from the arrangement of its elastic fibres, can be recognized as the peritoneal coat of the uterus. Peritoneal endothelium cannot be demonstrated.

Epicrisis.—From the history of the case, and particularly from the result of the histologic examination, the following conclusions can be drawn:

Mrs. D., at the time she was confined in August, 1896, had a hard labor, and there occurred during it a laceration of the cervix. There also occurred in the puerperal state a severe infection which led to profound inflammatory changes in the uterus. These were accompanied, or rather followed, by necrotic processes in the uterine mucous membrane, degenerative processes in the muscularis, extensive thromboses of vessels. At the area where the perforation was found—*i.e.*, near the tubal angle—the changes in consequence of inflammation, vascular degeneration, and malnutrition were most marked. There was probably here formed a necrotic sequester, which was removed at the moment the curette passed over the spot.

In the absence of a complete, systematic postmortem it is difficult to form an absolute opinion as to the cause of death. What appears very probable is that Mrs. D. died in consequence of an embolism of the pulmonary artery. In curetting a uterus in a condition like the one under discussion, it is certainly very possible that a thrombus in one of the diseased vessels may be loosened, taken up by the circulation, and carried into the heart or pulmonary artery.

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THE SURGICAL TREATMENT OF FIBROMYOMA.

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THE subject to which I am invited to call your attention is one of prime importance to the surgical world and one which is possibly receiving as much or more present attention than any other with which gynecology concerns itself. Since 1853, when Burnham and Kimball each performed hysterectomy for fibroid tumors (the former forced to the operation by accident, the latter by design) by amputation and ligature of the cervical neck with silk ligatures which were brought out of the lower angle of the abdominal wound and left to free themselves by sloughing, an almost infinite variety of procedures have been proposed and carried into practice for the relief and cure of this disease.

During the process of this development, broadly speaking, three distinct periods seem to have been encountered, each one of which has been dominated by the desire to accomplish a definite but a different object.

The *first* period covers that time when the object was the removal of the tumors. The question whether or not the uterus was sacrificed during the process was hardly considered; in fact, it seems to have been taken for granted that such must be the case.

The *second* period covers that time when an earnest effort was made to cause the ultimate disappearance of the tumors without taking the risks at that time incident to their direct removal.

The *third* period is the one in whose throes we are at present locked—the effort to remove the tumors without the sacrifice of either the ovaries, Fallopian tubes, or the uterus.

The results of the *first* period have created the basis of all our present work in this line. The various operations performed to-day are the fruit of the struggles and conquests of

our predecessors. For years surgeons floundered about apparently aimless, making little advance over the technique of Burnham and Kimball, with the exception of cutting the ligatures short or fixing the stump in the lower angle of the abdominal wound. Antiseptic surgery was, of course, playing its part and the results were becoming continually better, more, however, on account of the cleanliness than from any improvement in the management of the stump, until finally it gradually dawned upon the surgical world that the deeper vessels could be controlled by direct ligation, as well as could the more superficial ones, and that the cervical tissue itself had little to do directly with the heretofore troublesome hemorrhage. From this moment the advances were rapid and an altogether satisfactory and thoroughly safe technique was soon arrived at.

The fruits of the *second* period were mostly of a negative character, and although to-day they are monuments of noble efforts in the direction of ultimate perfection, they stand justly relegated to the category of procedures which were necessary in the process of development, but which have finally lost their usefulness.

The *curette* is now but seldom used, and when its aid is invoked it is merely for purposes of a temporary character and in the case of but one symptom of the disease—hemorrhage.

Ovariotomy was invoked under a mistaken theory that the ovary dominated the growth of fibroid tumors and that the neoplasms must necessarily shrink and disappear under the loss of its influence, and that as a matter of course the further progress of the disease or its inception was impossible. It has been long since demonstrated that the tumors did not with reasonable certainty shrink and disappear after the ovariotomy, that the symptoms did not routinely vanish, and that in some cases the tumors would even continue their growth. During the past winter, in Philadelphia, two patients have been operated upon (one by the reporter) for fibroid tumors of the uterus. The ovaries and Fallopian tubes had been completely enucleated years before (in one case nine years) with thorough establishment of the menopause, no sign of fibroid disease of the uterus existing at the time of the ovariotomy in either case; and yet in both cases fibroid tumors subsequently developed and required removal.

Ligation of the uterine vessels by way of the vagina, or the

ovarian vessels through the abdominal incision, have both depended for their success upon the theory of cutting off in part the blood supply of the neoplasms.   What else but failure could be anticipated when Nature's wonderful power of establishing collateral circulation was ignored?

Electricity found much of its temporary usefulness through the same source—a temporary lessening of the blood supply by induced uterine contraction.   In addition, cauterization of the uterine mucous membrane saved much loss of blood and the resultant anemia.

The results to be obtained by the methods of the *third* period remain still to be determined, and the whole subject of myomectomy is *sub judice*.

The recognized and generally established surgical procedures in the case of fibroid disease of the uterus at the present time are *hysterectomy* and *myomectomy*.

Hysterectomy may be performed by either the vaginal or abdominal route; it is complete or incomplete as the operator may prefer.

Performed by way of the VAGINA it is always complete—a panhysterectomy.   The general principles of the operation are identical with those of the operation performed through the abdominal incision, viz., the uterine and ovarian vessels are secured by means of separate compression forces—*ligatures* or *forceps*.   The forceps operations necessitate drainage, which is also the usual accompaniment of the ligature operation. However, in the case of a few operators, with the ligature this is omitted.

Performed by way of the ABDOMINAL incision the operation is completed as a panhysterectomy or as an amputation at the cervical neck.   In either case the principles involved are the same as in the vaginal operation—hemostasis by direct control of the uterine and ovarian vessels.   The *ligature*, *cauterization,* and *crushing* of the stumps are the methods adopted, the common and only thoroughly tested one being the ligature. Where the complete removal is practised, commonly the vaginal vault is allowed to remain open for purposes of drainage; this is by no means, however, the invariable practice, as many operators close the vault with sutures and eliminate drainage.   Amputation at the cervical neck was formerly performed after the method of the old serre-neud operation.   This practice has fallen into deserved disrepute, and almost univer-

sally ligatures are applied to the vessels, and after suturing the peritoneum over the cervical stump it is dropped back into the pelvis and drainage dispensed with.

This method appeals to the reporter as preferable to all others for the reasons that—

It is applicable to all cases.

It makes a shorter operation.

It requires less manipulation.

It opens up less connective-tissue space and consequently makes less traumatism.

There is less liability to septic infection, as the opening of the cervical canal is infinitely smaller and consequently more easily controlled than is the opening into the vagina when the cervix is removed.

During the manipulation the fingers enter neither the cervical canal nor the vagina.

The anatomical relations of the vaginal vault are kept intact and the vagina is in no degree foreshortened.

There is better opportunity to prevent sagging of the vaginal vault in closing the wounds than where the cervix has been removed.

On the other hand, no possible good can be obtained by the removal of the cervix.

The relative advantages between the *vaginal* and *abdominal route* for the performance of hysterectomy are altogether in favor of the latter.

In the *vaginal operation*, especially if the tumor or tumors have progressed in growth beyond a very small size—

No opportunity is offered for revising the diagnosis or the technique—the hysterectomy, once begun, must proceed;

The room for working is limited;

The organ and tumors must be removed piecemeal;

The opportunity for discovering and dealing with complications is reduced to a minimum;

The difficulty of dealing with injuries to the hollow viscera is greater, and in many cases impossible without the aid of an additional abdominal incision;

The length of the operation is greater;

The traumatism is greater;

The accurate closure of the wounds without the necessity of drainage is less practical;

The dangers of primary or subsequent infection are greater for the same reasons that obtain in the comparison between

the panhysterectomy and amputation methods through the abdominal incision.

The operation of *myomectomy* consists of the removal of the neoplasms by some method which leaves the uterus, Fallopian tubes, and ovaries intact. Theoretically and at first sight this procedure is the acme of good surgery, and from certain quarters the cry has gone forth that the acceptance of this operation as the one of choice must be the ultimate result of the development of the surgical treatment of patients suffering from fibroid disease of the uterus. Your reporter takes exception to this position *in toto*, and believes that all the proofs, including experience, tend to demonstrate that the converse to this is true.

Hysterectomy is the operation of choice in fibroid tumors of the uterus.

Myomectomy is only indicated where special reasons for so doing exist.

The dictum that myomectomy is an operation of choice must rest absolutely on the assumption—

That fibroid disease of the uterus is purely a local disease and confined solely to the uterus;

That the symptoms attributable to this disease are caused by the uterine neoplasm alone;

That all foci of the disease can be with reasonable certainty eradicated.

Not a single one of these assumptions comprises the whole truth.

Fibroid disease of the uterus is a general disease, as in counter-distinction to the idea that it is confined to the uterus itself. All the pelvic organs participate in a majority of cases to a greater or lesser extent. Some few years ago your reporter presented to the Philadelphia County Medical Society a series of specimens of fibroid tumors of the uterus, some thirty in number, which had been removed by hysterectomy, and called the attention of the Society to the fact that in every specimen presented, besides the fibroid degeneration of the womb, emphatic degeneration of the ovaries of a fibroid character, as well as most frequent cystic degeneration of both Fallopian tubes and ovaries, existed.

Since that time the correctness of his observation has grown more and more emphasized by further experience.

A careful perusal of the literature of reported cases more than amply fortifies his personal observations.

In addition the heart complications accompanying fibroid disease of the uterus are so marked and so commonly observed as to further emphasize the general character of the disease.

The fact that the predominant symptoms in a very considerable number of cases of this disease which come to operation are in no way directly due to the tumors in the uterus, is too well recognized to admit of discussion. Pain is rarely if ever due to the neoplasm, but on the other hand is almost invariably due either directly or indirectly to the accompanying ovarian or tubal degenerations or inflammations.

Not only is the disease of a general character (in a limited sense), but it is multiple in its manifestations. An unlimited number of separate and distinct fibroid nodules may exist in a given uterus; as many as thirty (Kelly) have been removed from a single specimen by myomectomy. But can all foci be detected and removed with certainty? Within a few weeks your reporter has removed a uterus by hysterectomy, and by splitting open the specimen in many directions has demonstrated as many as five distinct and separate nodules buried deep in the walls of the organ, none of which could be detected by palpation, even after they had been located and demonstrated by the aid of the knife. This condition to a more limited degree is by no means the exception, but is the rule. This has been so repeatedly observed, and is so readily demonstrated by any one choosing to inspect uteri the seat of fibroid disease, that it may be accepted as axiomatic.

Leaving out of the question for the moment the possibility of the continued growth of any one or all of these foci, it is a well-recognized fact that the relative size of the tumor has comparatively little to do with the resulting hemorrhage. The question of location bears more directly on the production of hemorrhage than does the size of the neoplasm, these small intramural or submucous growths being peculiarly hemorrhagic.

If it then be true, as is here contended, that, in the limited sense in which it is used, fibroid disease is usually a general one when it attacks the pelvic organs, how irrational it is as a matter of choice to remove part of the disease, especially as the parts which are left undisturbed in a large per cent of the cases give rise to the symptoms for which the operation was performed! Again, how irrational to propose as an operation of choice that which not only frequently fails to cure the patient, but leaves her in such a condition that there is a strong probability of the necessity of a second operation later in life!

Howard Kelly, the present advocate in America of myomectomy as an operation of choice, has reported 97 myomectomies performed during the past seven years. Of this number 3 are known to him to have had a recurrence of the growths, upon 2 of whom he has reoperated. When it is observed that the vast majority of these patients were operated upon in the service of a large general hospital, it would be no stretch of imagination to conceive that there were many other cases of recurrence, or cases in which recurrence will yet take place, of which the operator has no knowledge.

Hysterectomy would then seem to be the rational operation in all cases of fibroid disease of the pelvic organs, and should be the procedure of choice. The surgeon should always have some special justification for choosing myomectomy, such as—

The age of the patient;

The desire for children;

The necessity of an heir, and other sufficient reasons which in each individual case may arise and which should be weighed on their own merits.

Surely the woman has a right to determine these matters herself, and your reporter has no sympathy with that sentiment, so widespread and popular amongst doctors, which holds that woman's whole function in life is to bear children, no matter what it may cost her in risk or health and happiness. Primarily, woman is entitled to her health; childbearing is a secondary matter. Her duties in this respect are twofold:

To herself and family; to the state.

Her health being destroyed, the state loses its claims; it must look to the healthy woman.

As to herself and her family, she and she alone (aided possibly by her husband) is entitled to judge. It is the duty of the medical adviser not only to explain to her that myomectomy preserves her organs intact and preserves the possibility of childbearing, but it is at the same time his imperative duty to explain to her just as clearly the possibility that—

Her pains may not be cured;

Her hemorrhages may not cease;

The tumors may recur and require a subsequent operation;

The dangers of hemorrhage and sepsis following the operation are greater.

If these facts be fairly put before the patient there will be comparatively few myomectomies.

The dangers of hemorrhage and sepsis are beyond question
: eater following myomectomy than following hysterectomy

(especially by the method of amputation at the neck). It is perfectly true that very expert operators can in great measure overcome the difficulties of the conditions, but it must be borne in mind that in establishing the fact that myomectomy is an operation of choice rather than one of necessity, we are putting the justification for a more dangerous surgical procedure into the hands of thousands of bad or indifferent surgeons.

When the uterus has attempted to drive the submucous or intramural fibroid nodule from its cavity, and has rendered the tumor more or less pedunculated, the methods of enucleation or amputation practised through the cervical canal are proper and expedient.

Martin's method of splitting the uterus from its peritoneal aspect and enucleating submucous and intramural growths has a limited but growing place in gynecological surgery.

The whole question of the propriety of surgical interference with fibroid tumors of the uterus rests largely on the consideration of each case. The disease is essentially a benign one. The question to be decided is the one of health and future possibilities. That of health is largely determined by the—

Pain,	Pressure symptoms,
Hemorrhage,	Recurring attacks of peritonitis,
Rapidity of growth,	Mental condition,
Size,	Expediency.

As to the future of fibroid disease of the pelvis, it is well established that—

There is no natural cure other than the menopause;

There is no medical cure;

The menopause will relieve a certain proportion of cases only;

In others, at the time of the menopause the symptoms are frequently redoubled;

In still others, the establishment of the menopause is indefinitely postponed;

At some time or other during their existence the large majority of these cases will give rise to symptoms of sufficient gravity to demand surgical interference.

Your reporter has little faith in there being any greater danger of malignant degeneration of fibroid disease of this region than in any other part of the body. A large proportion of reported cases have undoubtedly been cases of malignancy from their incipiency.

MYOMA OVARII; ENDOTHELIOMA OVARII; CALCIFIED CORPUS LUTEUM.[1]

BY

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(With seven illustrations.)

The three cases to be reported in this paper represent pathologic findings only rarely met with in the ovary, and they therefore deserve to be placed on record.

I. LARGE MYOMA OF THE OVARY.

Myomata must be enumerated among the rarest connective-tissue tumors of the ovary. Some writers have formerly claimed that these neoplasms are never found in the ovary. There are, however, now on record a few well-authenticated cases of this kind, to which we can add another. Our case is that of a pure myoma like the one recently described by Martin and Orthmann,[2] who also quote the reports of similar tumors observed by Sangalli, Jacoby, Doran, and a few others. While pure myomata of the ovary are evidently very rare, fibromata are much more frequently found, though they are by no means very common. From a study of the literature of the subject, it appears that the pure myoma of the ovary to be here described is larger than any other one heretofore observed. There have been described, however, larger ovarian fibromata.

The history of the case is as follows: April 16, 1898, Mrs. O. J., Canton, Ill., 22 years old; married; a rather small though plump woman; has never had any children or miscarriages. The family history does not present anything particular; it is negative with reference to tumors. Mrs. J. began to menstruate at the age of 13 years; menses normal till 16 years. At this time patient had a fall from a bicycle and the handle bar struck her in the left inguinal region. She complained of

severe pain in the abdomen immediately after this accident and was laid up in bed for some time. Her menses ceased for three months, then reappeared and were regular for three months. Again they ceased, this time for four years. From 1897 to the present time she has flowed only occasionally.

Soon after the fall Mrs. J. noticed in her abdomen a lump the size of a hen's egg. This swelling gradually but slowly grew larger until about two or three months ago, when its size increased very rapidly to enormous dimensions, filling the whole lower portion of the abdomen. Mrs. J. complained of being nauseated at times, and being inconvenienced by frequent desire to micturate, also by being constipated, nervous, weak, and of suffering frequently from headaches and bearing-down pelvic pains.

A bimanual examination revealed the presence of a large, hard, roundish, smooth, non-fluctuating tumor situated entirely in the abdominal cavity. It was movable and distinct from the uterus, which, however, in consequence of traction, appeared to move with the tumor. In view of the fact that the tumor appeared perfectly distinct from the uterus, a probable diagnosis of large solid tumor of the ovary was made and an operation advised.

Operation April 16, 1898, at the Policlinic Hospital. The abdomen was opened by a median incision extending from half an inch above the symphysis pubis to very near the umbilicus. A large, oval, perfectly solid tumor of the right ovary presented. The new growth was smooth all over its surface and had not formed adhesions with any of the neighboring parts or organs. The uterus, the ovary and tube of the left side were normal. The abdominal cavity contained a moderate amount of clear, serous fluid. The large tumor of the right ovary and the tube of the same side, as well as the free fluid, were removed from the abdominal cavity.

Peritoneal Toilet —Abdominal wound closed by stages of interrupted sutures of catgut for the peritoneum and the muscle sheath and by silkworm gut for the superficial layers. The patient made an uneventful recovery. She was last heard from in April, 1899, when she stated in a letter that she was feeling very well and strong.

The tumor after removal weighed 9¾ pounds. It is egg-shaped in outline, its base *in situ* having been directed toward the right side. The diameters of the new growth are: 24 centimetres from side to side; 20 centimetres from above down-

ward; 14½ centimetres from before backward. The anterior
and posterior surfaces of the tumor are somewhat flattened;

Fig. 1.—Myoma of the ovary, 9¾ pounds in weight, 24 centimetres in its longest diameter.

the other surfaces are bulging and round. The entire growth
is surrounded by a firm, smooth capsule, which is shining and
highly translucent. It cannot be peeled off from the tumor
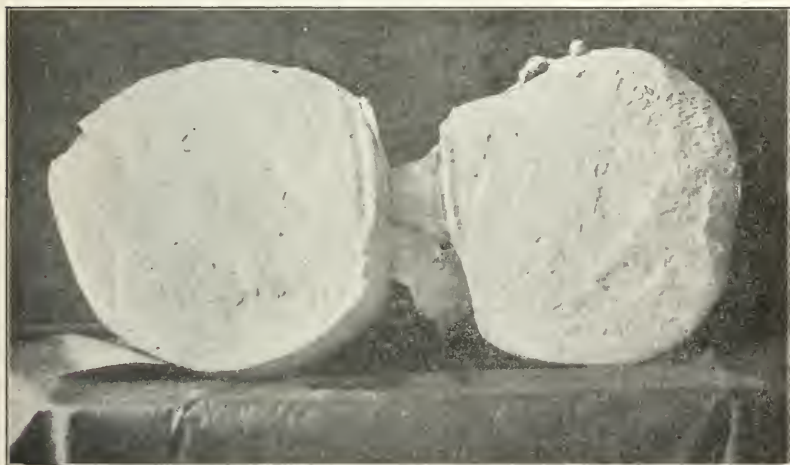
Fig. 2.—The myoma on the cut surface.

tissue proper, but is firmly adherent. On section the cut sur-
face of the very firm growth looks like a typical myoma of the

uterus. The tumor is solid throughout; cysts of any kind are not seen. No trace of normal ovarian tissue is left. At the place where the pedicle was severed close to the tumor, the lat-
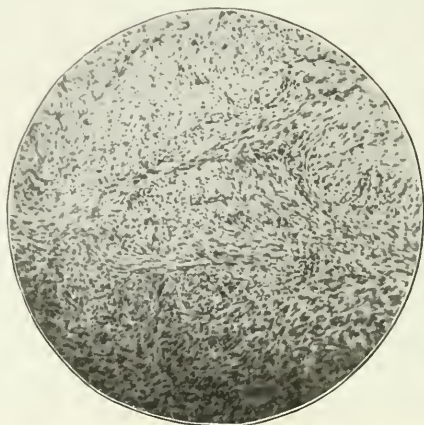
Fig. 3.—Section from myoma of the ovary, showing involuntary muscle cells. × .

ter is denuded of its capsule, and the triangular surface shows numerous tolerably large, gaping, fairly thick-walled blood
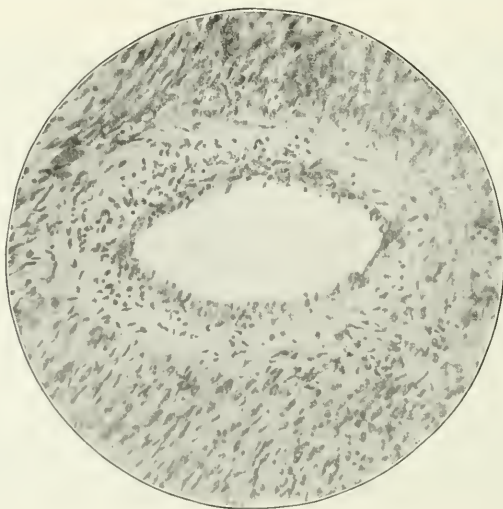
Fig. 4.—Section more highly magnified (× 200), showing origin of tumor cells from the muscularis of a vessel.

vessels. There was removed with the tumor part of the tube of the right side to the extent of $4\frac{1}{2}$ centimetres. The inter-

stitial part of the tube as far as removed is enlarged to a diameter of over 2 centimetres. The fimbriated extremity is quite large; spread out it has a diameter of 4 centimetres. The fimbria ovarica is particularly large, being $2\frac{1}{2}$ to 3 centimetres in length (Figs. 1 and 2).

Microscopic examination shows that the tumor tissue consists of involuntary, non-striped muscle cells. These are arranged in bundles which interlace each other freely. A study of the section shows that the neoplasm took its origin from the muscular coat of the vessels (Figs. 3 and 4).

The tumor above described is interesting from more than one point of view. Its large size is, of course, an unusual feature. It appears that the origin of this benign neoplasm is directly traceable to a trauma. It is, of course, somewhat dangerous to draw such a conclusion concerning a true tumor, but it appears clearly from the history that, after the accident described, menstrual disturbances set in and a progressive swelling of the abdomen was simultaneously noticed. The tumor first grew quite slowly; later on it suddenly increased its rate of growth enormously. Such behavior has been previously noticed in connection with solid benign connective-tissue tumors of the ovary. The presence of ascites is likewise a not uncommon feature in large fibromata or myomata of the ovary. The microscopic examination failed to demonstrate the presence of any normal ovarian tissue. The latter had evidently been entirely replaced by tumor tissue. The neoplasm very probably from its start developed diffusely in the ovary, as these tumors commonly do.

II. ENDOTHELIOMA OVARII.

A certain class of malignant tumors described formerly as alveolar sarcoma, carcinoma, or sarcoma carcinomatosum, is now more correctly classified as endotheliomata, since we know that they arise from endothelial cells. These neoplasms may be divided into vascular and lymphatic endotheliomata. The necessity for a proposed third group, called perithelioma (those endothelial tumors taking their origin from perivascular lymph spaces), does not appear to exist.

Endotheliomata have also been observed occasionally, but not frequently, in the ovary. Here they are sometimes of hard, sometimes of soft, consistence. They are generally unilateral, occasionally bilateral. Histologically the endotheliomata show an alveolar, a tubular, or a diffuse arrangement of

the proliferated endothelial cells. Any one of these types may be almost exclusively present, or they may all be found in one and the same tumor.

The case of endothelioma of the ovary to be reported occurred in a married woman about 30 years old. The patient, herself a practitioner of medicine, furnished the following history: "My trouble first began in the winter of 1891, previous to which time I had always had perfect health. First symptoms were irregular menstruation, severe nervous headache, and insomnia. In July, 1892, I had an attack of severe pain in the right ovarian region, attended with fever and complete prostration. Cause unknown. I gave it no attention, but attended to my business. Menstruation became less and less, till it stopped altogether for two years, during which time I felt perfectly well. I had a peculiar sensation on right side of abdomen just below waist line. I can scarcely describe it, but it reminded one somewhat of the first sensations of 'quickening.' This lasted several months while the tumor must have been forming. I had several of these attacks of pain of the character indicated. They were liable to come on any time without apparent cause. They were followed by intense soreness, a feeling like an attack of peritonitis. In the winter of 1896–97, after a long fifteen-mile drive to see a patient, I found I was flowing for the first time in over two years. I menstruated again after three months, and the flow now never stopped longer than for intervals of perhaps two or three days till my operation in September, 1897.

"Before the above-described trouble began I had always been well, never had hemorrhage, leucorrhea, or any form of uterine trouble. I was examined in the spring of 1896, when a growth the size of a hen's egg was found, supposed then to involve the broad ligament. The growth did not appear to grow much till the following winter. Was examined by Dr. Henrotin in April, 1897, while attending a course at the Policlinic. The doctor at this time told me the tumor was the size of his fist. He advised immediate operation. My husband would not consent.

"The tumor, having a pedicle, would swing down and across the rectum, causing me no little trouble all the summer. Bearing-down pains were followed by extreme tenderness. The enlargement of the right side appeared to increase. I became melancholy and unconcerned. No one, however, except my

husband, was aware that I had any trouble, and I attended to my practice up to the day I left for the operation."

Operation September 7, 1897, at the Policlinic Hospital. A median abdominal incision being made, there presented a tolerably soft, pediculated tumor of the right ovary. The new growth had not formed any adhesions to the surrounding parts. The pedicle was ligated without any difficulty and the growth removed.

The tumor as removed is of a grayish-white, somewhat pinkish color and fairly soft in consistence. It is almost spherical in shape and has a greatest periphery of 35 centimetres. It is surrounded by a perfectly smooth, shining, whitish, translucent capsule, through which are seen enlarged blood vessels. The new growth has entirely replaced the ovary, and no trace of normal ovarian tissue is visible. The place of attachment is marked by a triangular space over which the capsule is missing, so that the tumor tissue proper presents to view. Extending over the outer half of the upper margin is a part of the Fallopian tube. The part removed is 6 centimetres long, slightly tortuous in its course; the isthmus has a diameter varying from 0.7 to 1.4 centimetres. The fimbriated extremity is well developed and the ostium abdominale is open. Springing from the mesosalpinx about 2 centimetres to the inside of the outer margin of the ampulla, there is a stalked hydatid of Morgagni, about 1 centimetre in diameter, suspended from a short, constricted pedicle. The capsule of the tumor is intimately adherent.

Microscopic Examination.—The capsule investing the tumor consists of very densely packed, small, slender connective-tissue fibres. Epithelial cells as an external lining are not found. The tumor tissue proper consists of a stroma of spindle cells very similar in character to the normal ovarian stroma cells. Between these cells are found cells of medium size, round or cuboidal, with comparatively large nuclei rich in a finely granular chromatin. These tumor cells proper show a tendency to arrange themselves in alveolar masses or in tubular cords. In other places they are found infiltrating the stroma diffusely and irregularly. It is noticeable that the alveolar or tubular arrangement is never as sharply defined as in a carcinoma, but that the tumor cells, on the contrary, change their shape, approach the spindle type, and shade off gradually into the surrounding stroma. Favorable places

show that the tumor cells arise from proliferating lymphatic endothelia. The tumor is therefore to be classified as a lymphatic endothelioma. Follicles were not found in the tumor tissue; they appear to have completely perished in the new growth (Fig. 5).

In a letter dated September 19, 1899, the patient makes the following statement as to how she got along after the operation. She says: " I was a complete wreck for eighteen months after the operation and despaired of ever being myself again, but now am much better; have menstruated every three weeks since date of operation till this summer, now menstrual flow comes every twenty-eight days, very painful, pass shreds.
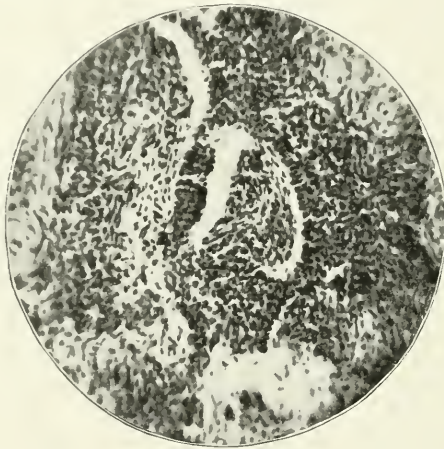
FIG. 5.—Endothelioma of the ovary Section showing origin of tumor cells from lymphatic endothelium.

Of what? I cannot tell. I think I have several times felt that ' peculiar sensation ' in my side; have had several attacks of bearing-down pain, followed by such tenderness that the least jar was painful." The patient's letter closes with a request to give a prognosis as to whether she has to expect any further trouble.

In answering this question it must be first stated that endotheliomata vary a good deal as to clinical type. And while they must in general be classified as malignant connective-tissue neoplasms, there are a good many cases on record of permanent cure after removal of these tumors. Besides, the sarcomatous neoplasms of the ovary—and to these the endotheliomata belong—are usually not as malignant as sarcomata in

most other parts of the body. Some statistics of permanent cure after removal of sarcoma of the ovary are quite favorable; for instance, those published a few years ago from the clinic of Czerny, who had over one-third permanent cures. In the case detailed above the chances of a permanent cure appear very good. There had not formed at the time of the operation any adhesions; the tumor was completely encapsulated, it had nowhere broken through. Tumors of the ovary of this type do not form early metastasis. At the time of the operation the chances for a permanent result appeared quite favorable. Since then over two years have elapsed. Mrs. X., while yet complaining about some menstrual disturbances, has for the last six or seven months been feeling fairly well. Signs of recurrence are not present. So the patient may be conscientiously assured that her chances for a permanent cure and non-recurrence of the growth are excellent.

III. CALCIFIED CORPUS LUTEUM.

Calcified corpora lutea of the ovary have but seldom been described. Such pathologic formations were either seen in the specimens obtained by an operation for other conditions, or in material collected from the postmortem table. These peculiar calcareous masses of the ovary were first mentioned by Morgagni, and other cases have been described by Rokitansky, Slavjanski, Sutton, Williams, Ries, Peterson, and Martin. The latter's "Diseases of the Ovaries and Tubes" is the only text book published which discusses the subject and gives a short review of the very scanty literature, which shows that the condition is very rare. It should be borne in mind, however, that diffuse calcareous deposits in the ovary in general are not so very rare, since we find them not infrequently as the consequence of inflammatory processes or of degenerative changes of tumors.

The case which we want to add to the very small list of reports of calcified corpora lutea presents the following features.[1]

Mrs. W. R. was operated August 11, 1898, at the St. Joseph Hospital. On opening the abdomen by a median incision it was found that the uterus contained four tolerably large intramural fibroids. The left ovary formed a flat mass of fibrous, tough tissue, from the outer lower corner of which there

[1] Unfortunately the report of this interesting case is in some respects incomplete, since the history has been lost and could not be replaced.

sprang a calcareous tumor to which a loop of intestines was adherent by means of fibrous bands. The latter were carefully ligated off and then the uterus, fibroids, and appendages of both sides were removed, the peritoneum sutured over the stump of the uterus, and the operation finished. She recovered promptly.

The calcareous mass removed (Fig. 6) is as big as a good-sized walnut. It is almost spherical, and the surface presents elevations and depressions which look very much like coiled loops of small intestines or like the convolutions of a brain. The elevations are, however, much more prominent than the convolutions of a brain, and the depressions are proportionately deeper. The hard mass can be split by the aid of a strong car-
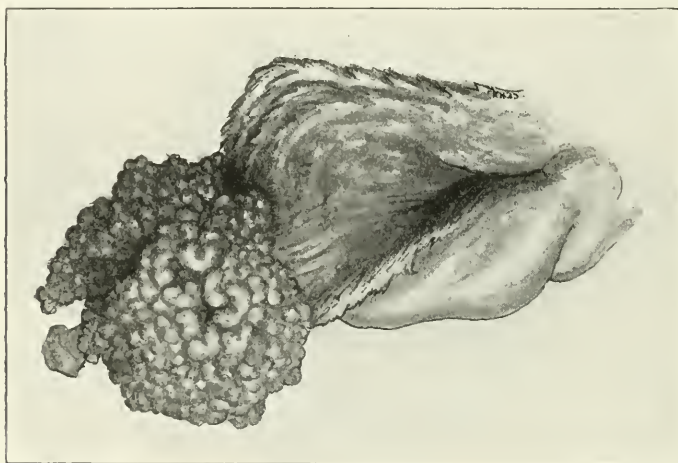
Fig. 6.—Calcified corpus luteum (natural size).

tilage knife and a hammer, and is found to be hollow. The cavity has a diameter of $1\frac{1}{2}$ centimetres, and the surrounding calcareous wall is over 5 millimetres thick. The inside of the cavity is lined by a thin, tough, and leathery membrane which is intimately adherent to the shell. The calcareous convolutions on the outside are likewise covered by a firmly adherent fibrous tissue. The soft tissue removed with the calcified mass is fibrous, tough, and completely flattened from before backward.

Microscopic Examination.—Pieces of the calcareous mass were decalcified, embedded, and then sectioned. It was found that the decalcification had not been complete, but some of the mineral matter had been left in the tissue. This occurrence,

while very hurtful to the cutting microtome knife, proved quite favorable in regard to orientation as to the zone of calcification (Fig. 7).

Microscopic examination shows that the peripheral parts of the sections (the zone representing the fibrous tissue covering the lime shell) consist of coarse hyaline fibres without nuclei. The inner zone (representing the inner membrane) is composed of the same elements. The middle zone, that appearing in black on the photomicrograph (black on account of the infiltrating, non-diaphanous lime salts), consists of finer fibres. They are not, like the outer and inner fibres, arranged in a con-
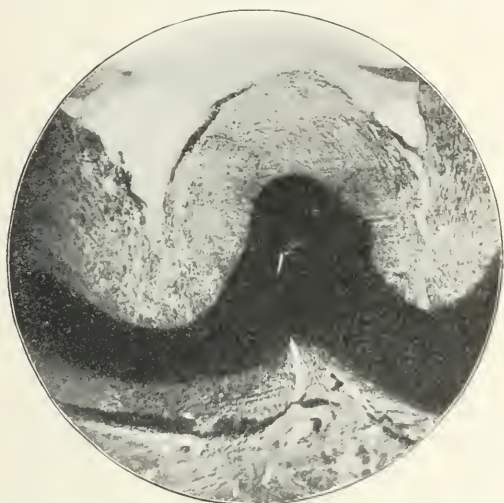
Fig. 7.—Section of calcified corpus luteum of the ovary (Low magnification.) The zone of calcification is indicated by the deep shadow in the photomicrograph.

centric, but in a radial manner. These fibres form the stroma for roundish or square spaces densely infiltrated with lime salts. The square or roundish spaces so outlined are identical in size, and more or less in outlines, with the lutein cells. It appears, therefore, that the process of calcification is most marked or exclusively confined to the lutein cells of the yellow body.

The soft, non-calcified ovarian tissue consists of old hyaline connective tissue, containing vessels with thickened walls, some in a state of hyaline degeneration. There are also found a number of corpora albicantia and patches of areolar tissue (remnants of fatty degeneration?).

The whole picture clearly shows that we are dealing with the remnants of profound chronic inflammatory processes. That the latter, in our case, are most likely responsible for the calcification of either a corpus luteum or possibly a corpus luteum abscess, appears clear from the histologic findings as well as from the other known features of the case (adhesion of intestine to calcareous mass). Most of the few cases of corpus luteum calcareous masses which have been reported point to an inflammatory origin. The case of Martin and Orthmann, referred to above, that of a woman suffering from a bilateral sactosalpinx purulenta and a unilateral corpus luteum abscess, also unmistakably point to inflammation as the cause of the calcification of the corpus luteum.

THE EARLY DIAGNOSIS OF UTERINE CANCER.[1]

BY

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(With sixteen illustrations.)

THE early diagnosis of uterine malignant disease is one of the most difficult and responsible which the physician is called upon to make. Every error in diagnosis costs a human life; every delay endangers one. All aids to diagnosis should be employed to arrive at an early conclusion. Nowhere in the whole range of medicine is it more true that " Qui bene diagnoscit, bene medebitur." And it is in most cases on the shoulders of the general practitioner that this heavy burden rests. For it is to him that the woman first applies for the relief of one or more of the symptoms which are present.

To attempt to make the diagnosis of uterine cancer from the symptoms alone is not only dangerous but impossible. *There are no symptoms that are pathognomonic of cancer of the uterus.* Pain, hemorrhage, and discharge, we were formerly told, were symptoms of uterine cancer. So they are, but woe to the woman who presents herself with these symptoms! Her case is almost certainly a hopeless one.

[1] Read before the New York County Medical Society, May 22, 1899.

Pain is unfortunately intimately associated in the mind of the laity with the development of cancer in any part of the body. But how often is it absent in the early stages of uterine cancer? How often do we hear, when we rebuke a patient who presents herself with an advanced uterine cancer, " Well, doctor, I would have come sooner for advice, but I had no pain whatever until recently." The diagnosis must be made before there is any pain, if we would cure our patients. Of all the aids to the early diagnosis of cancer of the uterus, *pain* is the least valuable.

Discharge is present very frequently where there is a uterine

Fig. 1.—Virginal uterus, 3½ inches long. Patient aged 50 years. Incision through posterior wall. Cervix normal. On right side of body of uterus is an ulceration extending up to the right cornu. Diagnosis of carcinoma made from uterine scrapings substantiated.

cancer. But this discharge is, in the early stages, not due to the new growth at all, but to the pre-existing endometritis. The rôle that catarrhal inflammations of the mucous membrane play in predisposing to the development of malignant disease will be referred to later.

Hemorrhage presents a more valuable diagnostic hint (if I may so express myself) in arousing our suspicions. More it cannot do. We certainly cannot diagnose cancer of any organ merely from hemorrhage. And least of all can we do so in the case of the uterus, the one organ that is subject to physiological hemorrhages. And how many other diseases of this

organ occasion hemorrhage! However, hemorrhage from the uterus, either as menorrhagia or as metrorrhagia, should always, no matter at what time of life, be looked upon with suspicion. Most suspicious is it at the time of the menopause.

And it is just in the menopause, as Winter truly points out, that we have the greatest bugbear to the early diagnosis of uterine cancer. How many hundred women yearly lose their lives because the "menopause" is blamed for symptoms that are produced by a beginning malignant growth! How frequently are we able to trace back the symptoms of an advanced

Fig. 2.—On posterior wall of uterus is a small alveolar carcinoma in an early stage of development.

uterine cancer to a neglected slight hemorrhage or discharge coming on about the time of the menopause!

Let us now look briefly to some of the etiological factors in the production of malignant uterine disease. First, as regards age. We are too apt to look for such disease in advanced age, and hence frequently overlook it in younger women. I have myself had the good fortune, or bad fortune, to operate on one case of far advanced sarcoma of the uterus in a multipara of 27 years, and also on a case of advanced carcinoma of the body of the uterus in a nullipara of 37 years. The former case had been treated by several physicians with caustics and douches;

the latter case did not come for treatment earlier because there had been no pain. Glater's statistics of deaths of women in Vienna during eight years showed:

Ages.	21 to 25 years.	26 to 30 years.	31 to 35 years.	36 to 40 years.	41 to 45 years.	46 to 50 years.	51 to 55 years.	56 to 60 years.	61 to 65 years.	66 to 70 years	71 to 77 years.
Total deaths..........	3899	3703	3094	3245	2855	2763	2579	2725	2890	2955	4688
Deaths from uterine cancer	4	39	45	118	133	183	142	108	59	60	38

Bäcker's statistics from the University Clinic of Budapest are even more striking. From 1882 to 1895, 11,095 women

Fig. 3.—Cervix normal. A small carcinomatous growth at the left cornu. Diagnosis made from the uterine scrapings.

were treated in the dispensary; 705 had uterine cancer, 6.35 per cent. Of the 705 women with cancer there were between

21 and 25 years..... 14	46 and 50 years............ 127
26 and 30 years...... 45	51 and 55 years................. 71
31 and 35 years..... 90	56 and 60 years................. 44
36 and 40 years......... ... .134	61 and 65 years..... 15
41 and 45 years.. 157	66 and 70 years................. 5

I.—During period of sexual activity, 21 to 45 years ....*62.4* per cent.
II.—At time of climacterium, 46 to 55 years...... .. .. 28 per cent.
III.—After time of climacterium, 56 to 70 years............ 9 per cent.

These statistics demonstrate conclusively a fact not generally

recognized, viz., that the majority of cases of uterine cancer are found before the menopause, and not a few of them during the earlier years of sexual activity. We must, therefore, be on the lookout, no matter what the age of the patient.

Have pre-existing pregnancies any influence on the development of cancer? Undoubtedly some, but more of an indirect nature, in that they give rise to endometritis.

In endometritis we have in all probability a very important etiological factor. In almost all cases of uterine cancer we find endometritis present. Out of seventy cases of cancer in

Fig. 4.—Adenocarcinoma at fundus uteri.

which the uterus was removed, Bäcker failed only three times to find an endometritis. As endometritis is common in nulliparæ as well as in virgins, we may expect among them also to find cancer develop, and so we do find it. I have already referred to my case of a nullipara who had an advanced carcinoma. Some time ago, through the kindness of Dr. Coe, I had an opportunity to examine the scrapings from the uterus of a virgin, and I diagnosed cancer. The uterus was removed and a small carcinomatous nodule was found at the fundus. The vagina was so small in this case that an abdominal hysterectomy was performed.

It was formerly believed that uterine lacerations were predisposing causes of cancer. This belief is not generally held to-day. Williams and Fehling both declare they never saw a carcinoma originate in such a tear.

Of course the general etiological factors, such as heredity, overwork, mental worry, and poor food, play some rôle here, as in the development of cancer in other parts of the body.

In summarizing we may conclude that no age is exempt from cancer of the uterus. We must expect to find it in early

FIG. 5. *From a case of early cancer of the uterus.*—Zeiss objective DD, ocular 2††. Magnified about 250. Cross-sections of several glands, showing enormous proliferation of the glandular epithelium The epithelial cells are arranged in an atypical manner, especially in the centre of the picture, where several glands are seen merging into one another.

life, in middle age, and more rarely in old age. It develops in virgins, in nulliparæ as well as in multiparæ. It rarely, if ever, develops from a cervical tear, but frequently develops from a chronically inflamed endometrium.

Since there are no symptoms that can be relied upon, what means have we to-day for arriving at an early diagnosis of a malignant uterine growth ?

1. Inspection and palpation, with or without an anesthetic. Even though a growth be seen or felt, we cannot be sure of its

structure. Then, again, it is our aim to diagnose cancer before the growth is large enough to be felt.

2. Dilatation of uterine cavity, with introduction of the finger. Here also, even though we feel an ulcerated surface or a new growth, we can at best thereby only find out which part of the uterus we are to scrape most carefully.

FIG. 6. *From an early case of alveolar carcinoma uteri.*—Zeiss objective AA, ocular 4. Magnified 90. The whole picture represents a small carcinomatous area, the growth being arranged in alveoli. Surrounding this mass is the muscular tissue of the uterus, some of which was removed with the curette. Most of the scrapings from this case showed a chronic interstitial endometritis. It was only after examining a number of sections that this picture was discovered. Here and there in the deeper layers (not seen in this picture) small nests of epithelial cells, and in one place the beginning formation of an epithelial " pearl," were found.

3. Microscopic examination of uterine scrapings. As I pointed out in a previous paper, we often find in the same uterus areas of approximately normal tissue side by side with areas showing malignant degeneration. Naturally, therefore, the uterus should be scraped most carefully to remove as much tissue as can safely be done. For this purpose the cervical

and uterine canals must generally be dilated, and a sharp curette should *always* be used. Not the slightest reliance can be placed on an examination of scrapings removed with a dull instrument. Very often the new growth starts as a hard nodule, over which a dull instrument would glide without removing any part of it. Then, again, some new growths orig-
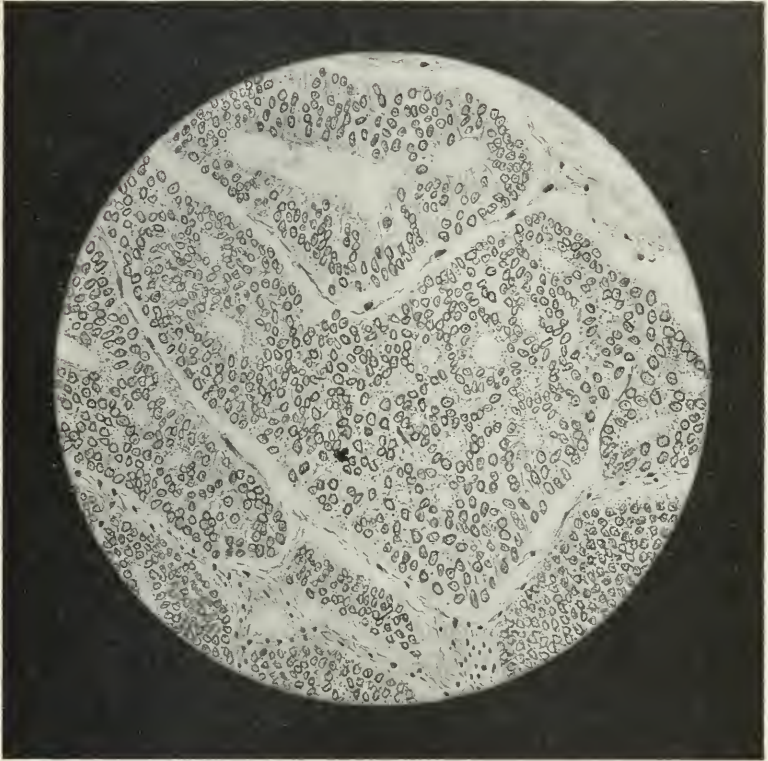
FIG. 7. *Adenocarcinoma of the uterus* (early case).—Zeiss objective DD, ocular 2. Magnified 240. The central portion of the picture shows a number of glands merged into one another, their walls being almost entirely obliterated. There is very little connective tissue present. The epithelial cells are packed closely next to one another and vary in size and in outline.

inate at some distance from the surface. By scraping with a sharp curette we can break down the intervening barrier and remove some of the deeper diseased tissues for examination.

For the method of preparing the scrapings for the microscope I would refer to my former paper. The peculiarities of this branch of work I have attempted there to point out. The

amount of time and labor that is sometimes required to arrive at a positive diagnosis can be appreciated only by those who have interested themselves in this work.

What do we hope to accomplish by all this work? We hope to steadily increase not only the number of operable

FIG. 8. *Adenoma malignum* (from a section made in Dresden).—The adenoma extends deeply down into the muscularis. On either side of the picture is seen the muscular tissue of the uterus. The walls of the glands vary much in thickness. The epithelium is irregularly arranged in multiple layers. The glands are packed closely together, separated only by a thin layer of muscular tissue.

cases, but also the number of permanent cures of cases of uterine cancer.

The technique of hysterectomy, both abdominal and vaginal, has been brought to such a stage of perfection that it is hard to see how it can be much improved on. And still the statis-

tics of hysterectomy for cancer are lamentable. I mean as regards permanent cures. Sixty-six per cent of failures is to-day a fair showing. Jacobs, of Brussels, a most skilled operator, informed me three years ago that of over 70 cases of uterine cancer in which he had removed the uterus, only 3 were alive four years after the operation. Thorn, of Magdeburg,

FIG. 9. *From an early case of uterine cancer.*—Zeiss objective DD, ocular 2. Magnified about 275. The glands are packed closely together, with very little intervening connective tissue. The epithelial cells are in multiple layers and are irregularly arranged. The walls of the glands vary considerably in thickness. In the centre of the field two glands are seen to coalesce, their intervening walls having been destroyed by the proliferating epithelial cells.

recently reported that after five years less than 30 per cent of the operated cases were alive. This is due to the fact, he says, that 70 per cent of all uterine cancers are inoperable at the time of the first examination, and of the remaining 30 per cent there are many in which the disease has extended beyond the uterus. Out of 705 cases of cancer of the uterus, Bäcker, of

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Budapest, reported 70 in which hysterectomy could be performed—only 10 per cent. And how very few even of this small number remained radically cured! Winter, in Berlin (now in Königsberg), has for several years been urging the medical profession to make earlier diagnoses with aid of the microscope. His work in this direction is bearing fruit, as
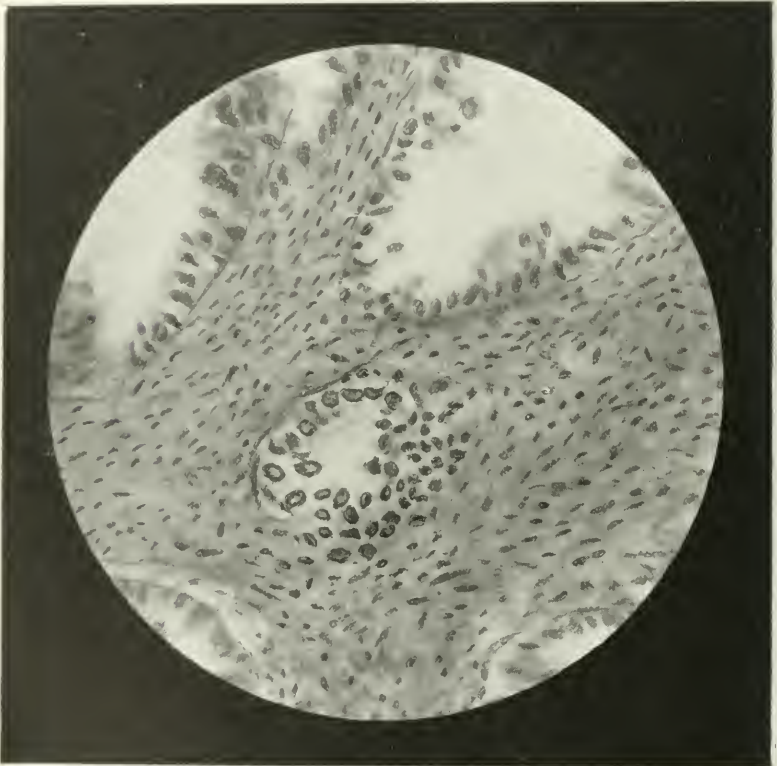
Fig. 10. *From a moderately far advanced case of cancer of the uterus.*—Zeiss objective DD, ocular 4. Magnified 250. At the sides of the picture are seen sections of carcinomatous glands. In the centre of the picture the proliferating epithelial cells can be seen breaking through the wall of the gland.

seen by the fact that each year in Berlin more women with uterine cancer come early for treatment. Winter traced the methods pursued by the doctors of 47 women with this disease. In only a little over 50 per cent of the cases was a vaginal examination immediately made. In 6 cases where such an examination was made the doctors treated with caustics,

douches, and internal hemostatics. In 15 cases, in spite of pelvic symptoms, especially hemorrhage and discharge, no examination was made, but the patient was treated symptomatically until she became alarmed and consulted another physician. Generally the doctor reassured the patient because the discharge was not offensive, forgetting that where the dis-

Fig. 11. *From an early case of adenocarcinoma of the uterus.*—Zeiss objective DD, ocular 2. Magnified 240. Shows remains of numerous glands, some fairly well preserved, others almost completely destroyed. The epithelial cells distinctly show the tendency to typical proliferation. There is very little connective tissue between the glands.

charge is offensive the case is generally hopeless. Winter concludes that uterine cancer is a local disease, is curable in every case if operated on early enough. In a similar vein Fritsch remarks that if we cure 15 uterine cancers definitely, we would have cured the other 85 just as definitely if they had come for treatment as early as the 15. I will not quote the

statistics of American operators, but will only say that the percentage of early cases of cancer is larger in Germany than here. The cause for this is to be found solely in the fact that there the microscope is being continually employed for the examination of uterine scrapings, and frequently what was thought clinically to be a case of ordinary endometritis turns
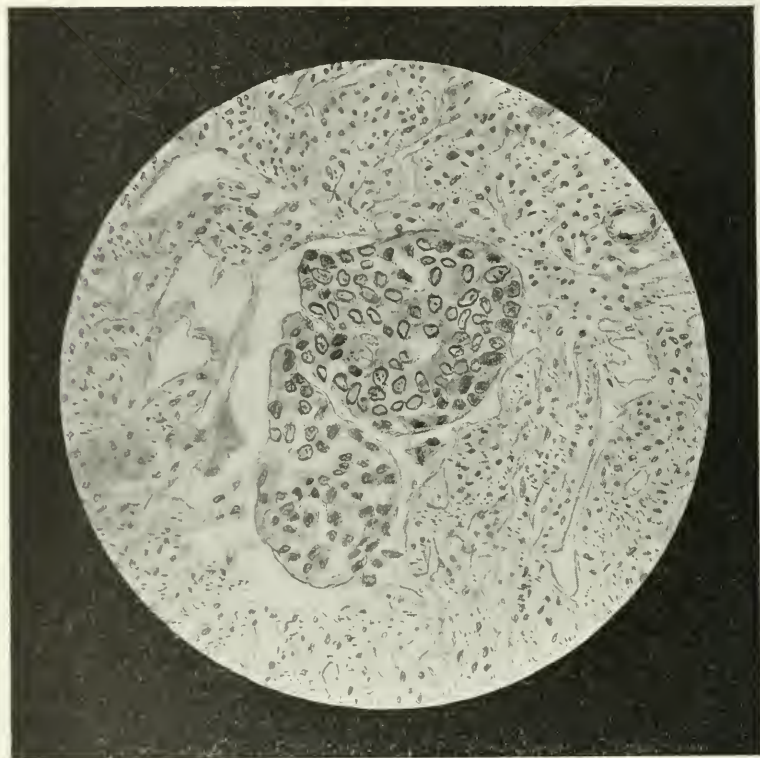
FIG. 12. *From an early case of adenocarcinoma uteri.*—Zeiss objective DD, ocular 2. Magnified 240. A small carcinomatous area is seen in the centre of the field. It is surrounded by connective tissue rich in small round and spindle cells. The carcinomatous mass is sharply defined and is situated at some distance from the uterine mucous membrane, which is not seen in the picture.

out to be a beginning malignant growth. That the examination of uterine scrapings is tedious and laborious I have before mentioned. But we must remember that on our diagnosis a human life frequently depends.

Malignant disease of the uterus must, by the scrapings, be distinguished from:

1. *Endometritis, glandular or interstitial.* This, with practice, is generally easy.

2. *Necrotic myomata.* The presence of muscular fibres aids in the diagnosis.

3. *Polypi.* Malignant degeneration of a long-standing polyp is not uncommon.

4. *Placenta retenta.* Here the question arises whether we

FIG. 13. *Adenocarcinoma of the uterus* (early case).—Zeiss objective DD, ocular 2. Magnified 250. Shows cross and longitudinal sections of twelve or more glands in different stages of preservation. The proliferating epithelial cells have destroyed the walls of the glands in most part, so that the glands merge into one another. The nuclei of the epithelial cells vary in size and in shape; nowhere can the cell outline be defined.

have merely placental tissue or the carcinoma syncytiale of Kossman.

5. *Abortion.* The enormous hypertrophy of the glands and the epithelial proliferation, together with the presence of many large spindle cells, may tend to deceive.

Strange as it may seem, pregnancy may, in rare cases, be mistaken for cancer. A case in which the scrapings were

kindly submitted to me by Dr. Boldt is one in point. Some of the scrapings had been examined by a well-known pathologist of this city, who made the diagnosis of cancer. After a careful examination of a large number of sections I reported that, while I inclined toward the diagnosis of a benign growth, I desired to see what progress the disease made in a few weeks.
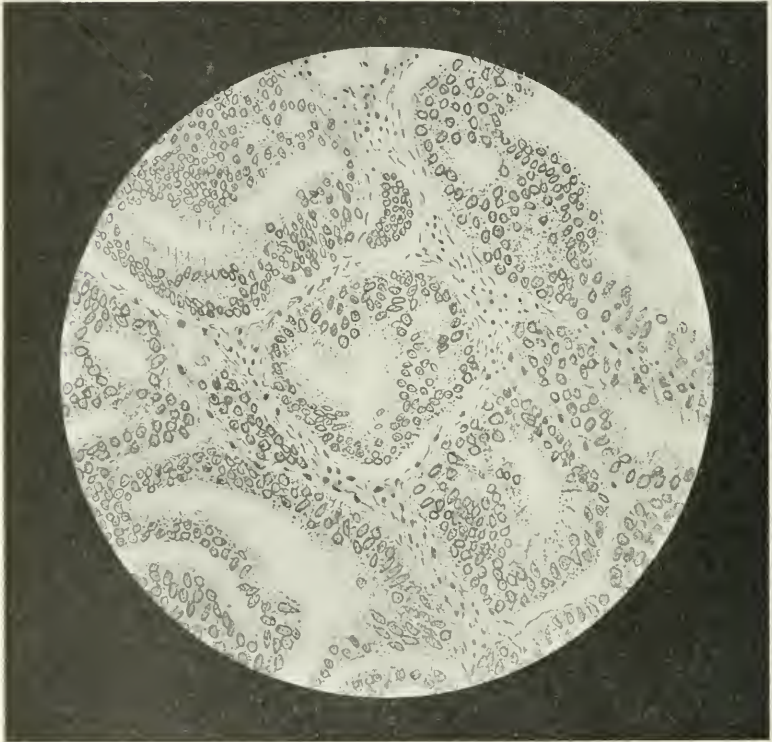
FIG. 14. *From a case of adenocarcinoma of the uterus.*—Zeiss objective DD, ocular 2. Magnified 240. Outlines of glands fairly well preserved, but very little connective tissue between them. In places two glands may be seen merging into each other. The epithelial cells are irregularly arranged and vary much in shape and size.

Three weeks later I made the diagnosis of endometritis post abortum, and was gratified to hear that Dr. Welch, of Baltimore, had also diagnosed abortion. This will give an idea of the difficulties one sometimes encounters in this kind of work. But it should, I take it, only stimulate us to renewed effort, always keeping before us the object we wish to attain—*i.e.*, to

prevent a healthy uterus from being needlessly sacrificed, and, by removing a diseased organ in good time, prevent a useful life from being lost.

The most modern and exhaustive paper on this subject is that read by Gessner before the Berlin Obstetrical Society in November, 1896. His work was done at the University Clinic
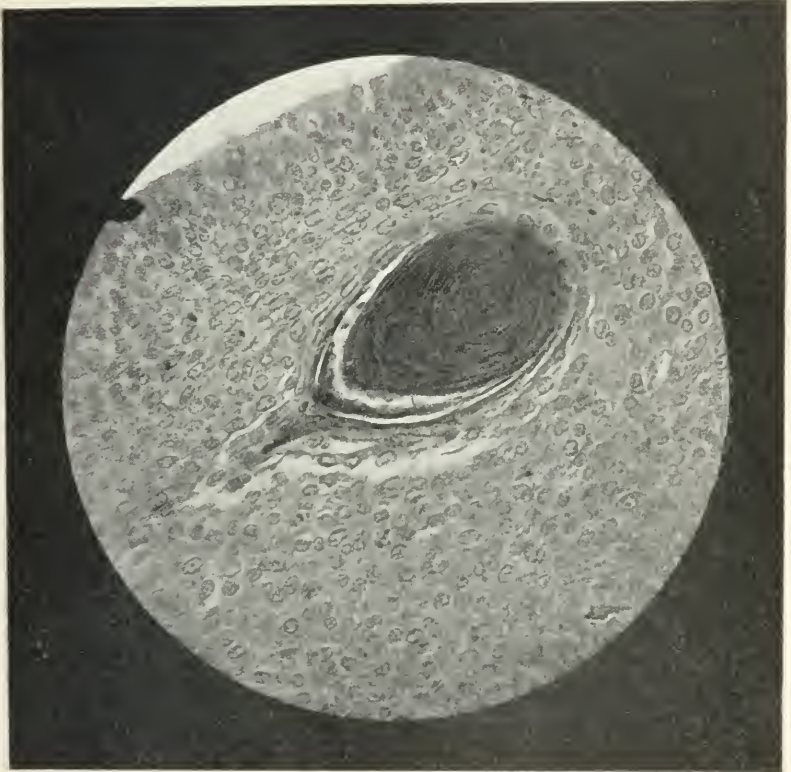
FIG. 15. *Advanced cancer of the uterus.*—Zeiss objective DD, ocular 2. Magnified 240. The epithelial (cancer) cells are packed closely next to one another, and in the centre of the picture there is an epithelial " pearl."

in Berlin. From 1890 to 1896, 58 hysterectomies were performed on account of malignant disease of the corpus uteri. In 11 cases of carcinoma and in 3 cases of sarcoma the tumor was felt. In 3 cases a " polyp" that was removed was shown to be sarcomatous. In the remaining 41 cases *the diagnosis was made solely from the microscopical examination of the*

uterine scrapings. In all of the cases sections were made from the new growth and the diagnosis of malignancy was confirmed.

In analyzing these 41 cases we find that the carcinoma developed twice in unmarried women and ten times in nulliparæ. The ages ranged from 33 to 73 years; the youngest, a patient of 33 years, was a nullipara. The average number of

Fig. 16. *From an early case of adenocarcinoma of the uterus.*—Zeiss objective DD, projection ocular 4. Magnified about 250. In the centre of the field is seen a small carcinomatous area. In this area the lumina of several glands are still to be seen, although their walls have been obliterated by the epithelial proliferation.

children was 3.9. So we see that although a malignant new growth of the uterus is more likely to develop in middle-aged multiparous women, we must expect to find it even in young nulliparæ.

In some of the cases carcinoma was mistaken for sarcoma, but it is well known that in their structure some new growths are on the border line of the two.

In one case Gessner says that the microscopic diagnosis was adenocarcinoma together with unchanged mucous membrane. After the uterus was removed pieces were examined from eight different parts of the uterus and no trace of malignant disease could be found. The case was set down as one of wrong diagnosis. Gessner then made serial sections through the whole uterus, beginning at the fundus. When, after an enormous amount of labor, he came to the region of the internal os, he was splendidly rewarded by finding an area 6 millimetres in diameter, on the posterior wall of the uterus, which showed adenocarcinoma. What more brilliant proof of the value of microscopic examination could be demanded?

To these 41 cases of Gessner I shall add a few from other sources. Bröse reported the case of a woman of 53 who came on account of repeated small hemorrhages without any other symptoms. On examining with a sound the uterus felt smooth. An existing senile vaginitis was cured, but still slight hemorrhages occurred at times. With the curette very little mucous membrane could be removed. On microscopic section adenocarcinoma was found in places. The uterus was removed, and on splitting it open a very small nodule was found in the left horn, which proved to be adenocarcinoma. Ruge reports a case where, in several places in the sections made from the uterine scrapings, malignant degeneration showed itself. The uterus was removed, but it was only after careful examination that a small malignant area was found. Lauwers recently reported 4 cases of cancer of the uterus, in all of which the early diagnosis was made by the microscope. One patient was a virgin, three were married. One patient was 31 years old and had four children. Five months before presenting herself she had had an abortion with severe hemorrhage, which persisted. A carcinomatous tumor the size of a pigeon's egg was found at the fundus. This is indeed a striking case, and emphasizes what was said above in regard to being on the lookout for uterine cancer in young women. My own case of advanced alveolar sarcoma in a young woman of 27 I have already referred to.

I may now be permitted briefly to narrate a few cases in which I was enabled to arrive at an early diagnosis with the aid of the microscope:

Case.	History.	Examination.	Curettage.	Diagnosis from scrapings.	Examination of uterus after its removal.
I. Virgin, 50yrs	Menopause two years. During past six months, irregular hemorrhages, not profuse. *No leucorrhea. No pain.* General health good.	Uterus 3½ inches long. Movable os contracted.	Curette removed one drachm of cauliflower material with slight hemorrhage.	Adenocarcinoma, together with marked glandular endometritis.	Uterus slit open. A carcinomatous ulcer found on right wall near the fundus.
II. Nullipara, 50 yrs.	Menopause four years. Slight bloody discharge at intervals for a year. No pain. General health excellent.	Uterus 2½ inches; feels soft. No hemorrhage and no reaction after the curettage.	Curette removed small amount of endometrium.	Adenocarcinoma.	Small tumor found at fundus of uterus—carcinoma.
III. Multipara. 39 yrs.	Menorrhagia and metrorrhagia. Slight discharge, not offensive.	Uterus somewhat enlarged and bleeds slightly after sounding.	Small amount of material removed.	Chronic interstitial endometritis and small area of alveolar carcinoma.	On splitting open the uterus, a small circumscribed growth was found at the left horn. It proved to be adenocarcinoma. Cervix was normal.
IV. Nullipara, 50 yrs.	Menopause four or five years ago. During past three or four months had occasional slight "show." No watery discharge. No pain.	On posterior lip of cervix, an ulcer, the size of a dime, which had been diagnosed as epithelioma. Uterus 3 inches, soft.	Curette removed small amount of brain like material, and perforated the fundus.	Scrapings showed adenocarcinoma.	Tumor filling upper half of uterine cavity—adenocarcinoma. Ulcer of cervix found to be benign.

Of these 4 cases of uterine cancer in an early stage, 1 was a virgin, 2 never bore children, and the 1 who bore children was only 39 years old.

To recapitulate:

1. Cancer of the uterus should be diagnosed with the microscope.

2. Cancer should be suspected in women of all ages—in virgins, in nulliparæ, as well as in multiparæ.

3. Atypical hemorrhages should always arouse suspicion, even at the time of the menopause.

The sooner women at the time of the menopause are impressed by the fact that the menopause itself is responsible for very few of the symptoms from which so many of them suffer at that time, and the sooner they learn that so many of their sex are losing their lives on account of neglected slight hemorrhages or discharges coming on during or after the menopause, the sooner we may hope to see more early cases of uterine cancer.

The mortality of cancer in other parts of the body is being continually reduced, whereas the mortality of uterine cancer is still frightfully high. True it is that improved methods of obstetrics have reduced the total number of cases; but of those cases that present themselves for operative treatment, how few can be cured! Surely the technique for the removal of the uterus has been improved as much and even more than that for the removal of the breast; and yet how many more cases of mammary cancer are cured! The cause, then, lies only in the failure to diagnose the disease early enough. With an early diagnosis and an early operation the mortality from cancer of the uterus should be no higher than that from cancer of the breast. It seems strange that we have not already arrived at this stage, particularly as we have before us an organ that is in direct communication, through a large open canal, with the outside world. We have only to introduce a speculum, dilate the uterine canal, and scrape away some diseased tissue to enable us to diagnose malignancy at its very earliest stage. And why is this not done more frequently? Only, I believe, because we have not been sufficiently on the lookout for cancer of the uterus. Do we have more cases of appendicitis now than we had before Willard Parker taught us to diagnose and operate on such cases? Do we have more cases of ectopic gestation now than formerly when we did not look for them? Assuredly not. So I firmly believe the time will soon come when we shall be as much on the lookout for early uterine cancer as we are to-day for ectopic gestation and appendicitis. Then, and not till then, may we hope to reduce the mortality of this dread disease.

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SHALL WE ABANDON VENTROFIXATION OF THE UTERUS?[1]

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(With five illustrations.)

IT will be noticed that a question is here asked. This, then, would imply that some doubt exists as to the propriety of the operation of fixing or suspending the uterus to the abdominal wall. The correction of displacements of the uterus has occupied the attention of the profession for many years; and, until gynecic surgery obtained the strong foothold that it occupies to-day, little else, aside from the use of various pessaries and supports, was ever resorted to. It is not my purpose to condemn the use of the pessary in properly selected cases. On the contrary, I am sure it has a place in the treatment of cases of procidentia, versions, and flexions, where previous peri-inflammations have left no adhesions, and where no inflammatory condition of the tubes and ovaries exists.

To properly fit and adjust a pessary in a simple and uncomplicated case of version or flexion is not to consign a woman to the use of a pessary for the remainder of her life. On the contrary, many cases, if treated in time, and properly treated, escape surgical interference; and the wearing of a properly

[1] Read before the American Association of Obstetricians and Gynecologists, at Indianapolis, September 19–21, 1899.

shaped and adjusted pessary often gives immediate and permanent relief, and, after the correction of the condition for which it was used, can be abandoned. But it must be admitted that there are many cases that haunt the office of the physician that cannot be benefited by the means alluded to and are amenable to nothing short of surgical treatment. To this class of cases have the various surgical methods been applied. The fact that *many* surgical operations have been devised by many operators for the same conditions would imply that no ideal operation now exists and that heretofore the work done in this direction has been largely experimental. This is
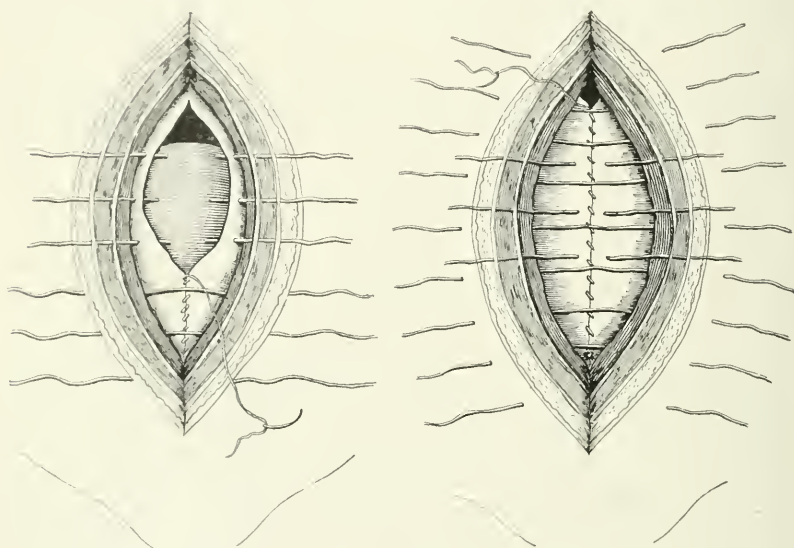
Fig. 1.   Fig. 2.
Showing method of suturing.

accentuated by the fact that by a review of this work it will be found that there are to-day good men advocating different methods from what they spoke approvingly of only a few years ago. Total failures and disappointing and unsatisfactory results have followed every operator in the practice of all the different methods used to correct retrodeviations and descensus of the uterus since surgical methods have been brought forward.

It is not my purpose in this short paper to discuss the different methods of correction of displacements of the uterus, nor the results or accidents that are liable and occasionally follow

them; but it is rather for the purpose of drawing attention to one method which, on account of the unfortunate results that have now and then followed it, has been to a certain extent abandoned by some operators. It is that of ventrofixation. By ventrofixation, as practised by myself, I do not mean ventrosuspension as originated and practised by Kelly and others. My experience, while limited, has not been followed by the results reported by others who have worked along the same lines. Whether my technique is different and may have some better features I do not know; but the fact remains that the results have all been highly satisfactory in my hands. Up to
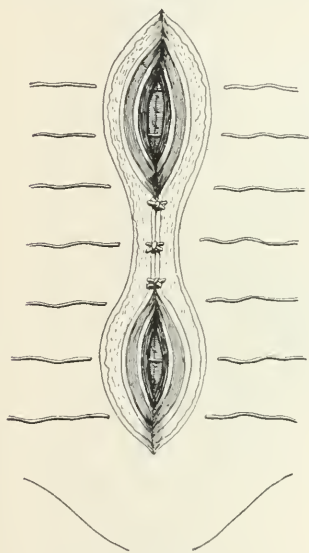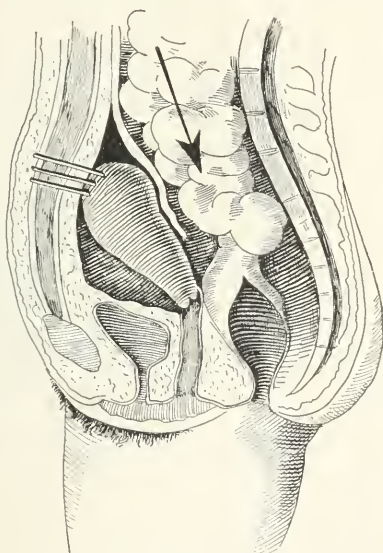
Fig. 3.   Fig. 4.

Uterine stitches tied and fundus held against anterior abdominal wall.

four weeks ago I had made thirty-eight ventrofixations, and up to this time have had no failures so far as to keeping the uterus in its proper place. Four have borne children without any of the usual troubles reported in pregnancy or during the delivery of the child, and none have had entanglements of the bowels or omentum. Of these, eight were done to correct different degrees of prolapsus, and the remainder were for retroflexions and retroversions. Fifteen of the latter were complicated with ruptures of the perineum and cervix, which were previously repaired by myself or others before the final operation was done. Sixteen were in married women of the child-

bearing age and between the ages of 23 and 39 years. Twelve were in cases of marked disease of the adnexa; five of double pyosalpinx and abscess of one or both ovaries; and two of disease of one tube and one ovary. Six were in marked neurasthenic women in whom there was a pronounced relaxed condition of the entire muscular system, predisposing the individual toward retrodeviation.

Technique of the Operation.—The patient is anesthetized by chloroform and placed in the Trendelenburg position, the abdomen and pubes having previously been cleansed and prepared according to the approved antiseptic methods of the day.
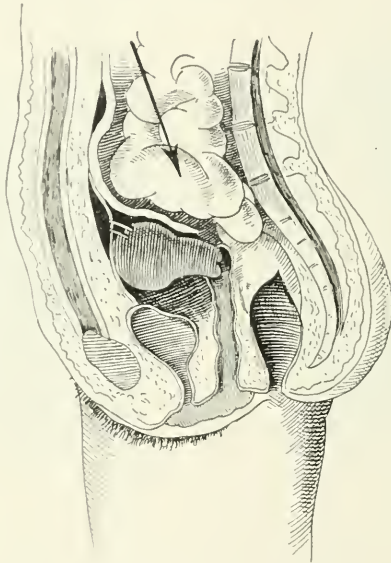
FIG. 5.—Showing stripping of peritoneum from abdominal wall when sutures are improperly placed.

An incision, ranging from three and a half to four and a half inches long, according to the thickness of the abdominal wall, is made in the median line, greater care being taken than is usual to follow the linea alba, for reasons to be hereafter stated. As soon as the abdominal cavity is reached the right hand is introduced with the palm looking toward the pubis. Adhesions are now sought for, and if any are found they are divided by inserting and cutting between ligatures. If the tubes and ovaries are diseased they are resected or removed. The uterus is then lifted up by grasping it at or a little above the fundus, with the thumb on the anterior surface and the fingers on the posterior surface. It is now held forward and upward by a double tenaculum forceps attached at the fundus

by the assistant. A double curved needle, armed with an ordinary kangaroo tendon, is now inserted and passed through the sheath of the rectus muscle on the anterior aspect of the rectus, and passed around the inner border of the rectus, emerging from the posterior layer of the sheath about one-eighth of an inch under the inner border, in order to grasp from three-quarters to an inch of the sheath. It then passes out of this sheath and through the subperitoneal fat and peritoneum, emerging about a quarter of an inch from the incision. By following this course the attempt is made to grasp the sheath of the muscle only and avoid taking in the muscular fibres. The needle is now inserted at a point about an eighth of an inch to the right and below the centre of the fundus, on the anterior and not the posterior wall, and emerges at a corresponding point on the left side of the organ, and passes through the same structures as in the opposite side of the incision in the anterior abdominal wall, but in a reverse order. The sutures are now held by catch forceps till other steps in the operation are completed. From one to two more such sutures, placed about a half-inch apart, are taken (Fig. 1).

The next step in the operation is the introduction of the closing sutures, which are of silkworm gut. Before closing the abdomen the parietal peritoneum and the peritoneal covering on the anterior wall and the anterior portion of the fundus are scarified with a bistoury.

The peritoneum is closed by a running suture of catgut, as is indicated in Fig. 2. The order of tying the sutures is: 1. The running suture in the peritoneum. 2. The kangaroo tendons (Fig. 3). 3. The silkworm gut closing the walls *en masse*. In the execution of this operation care should be taken not to attach the uterus too high up, so that the tension will not be too great; also, to guard against too deeply piercing the uterus with the needle, for fear of going into the cavity of the organ.

It is shown by the preceding text, as well as by the figures, that the uterus is attached to the abdominal wall by the approximation of the anterior portion of the fundus, and not by the posterior wall. This is to avoid the formation of long bands of adhesion for the entanglement of bowel and omentum, as is apt to be the case in the so-called improved or modified operation. The advantages to be gained by this operation are:

(*a*) It holds the organ in a more natural position, and long and dangerous bands of adhesion are not so apt to form, for the reason that the intra-abdominal pressure is not directed at right angles to the long axis of the uterus.

(*b*) The omentum falls down behind the uterus (Fig. 4) instead of in front, as is the case with the modified operation.

(*c*) The stitches are carried into the wall, gathering up the fibrous structure of the aponeurosis or sheaths of the recti muscles, and are not as apt to lengthen out.

(*d*) On account of the formation of shorter bands, the retro-deviation or prolapse is not so liable to recur.

In regard to the other apparent advantages of ventrofixation over other operations to correct retrodeviations or procidentias, it is seen that it permits, by the opening of the abdomen, of a thorough exploration of the uterine adnexa and the removal of diseased structures that cannot be accomplished with the same facility in other operations except the intra-abdominal shortening of the round ligaments and the operation of tucking them up as is devised by Ruth. The chief objections are: 1. The complications liable to arise in subsequent pregnancies and deliveries, which, however, has not occurred after my operations. 2. The formation of dangerous bands for the entanglement of bowel and omentum, which is reduced to the minimum by the anterior attachment.

These must, in all candor, be admitted; but when we consider the failures that are apt to follow the Alexander operation, together with resulting pathologic changes in other operations, are we not justified in the continuation of the practice of anterior ventrofixation, not ventrosuspension or ventrosuspensio uteri?

3941 WEST BELLE PLACE.

CASE OF PERSISTENT FETAL BLADDER IN A FORTY-FIVE-YEAR-OLD WOMAN.[1]

BY

HENRY J. GARRIGUES, A.M., M.D.,
New York.

(With illustration.)

IN one of the earliest stages of development a sac is formed from the posterior part of the gut, which is called *allantois*. The outer, that is, the extra-fetal, part of this organ carries

[1] Read before the Obstetric Section of the Academy of Medicine, October 26, 1899.

blood vessels through the umbilical cord to the villi of the chorion and thus eventually serves to form an important part of the placenta.   The intra-fetal part constitutes the fetal bladder, called urachus, and in course of time the upper part of it normally dwindles down to a solid fibrous cord, extending from the summit of the bladder to the umbilicus, which cord retains the name of *urachus*.   This cord may contain in its interior a long cavity, subdivided by partitions, and lined with epithelium like that of the bladder (Luschka).
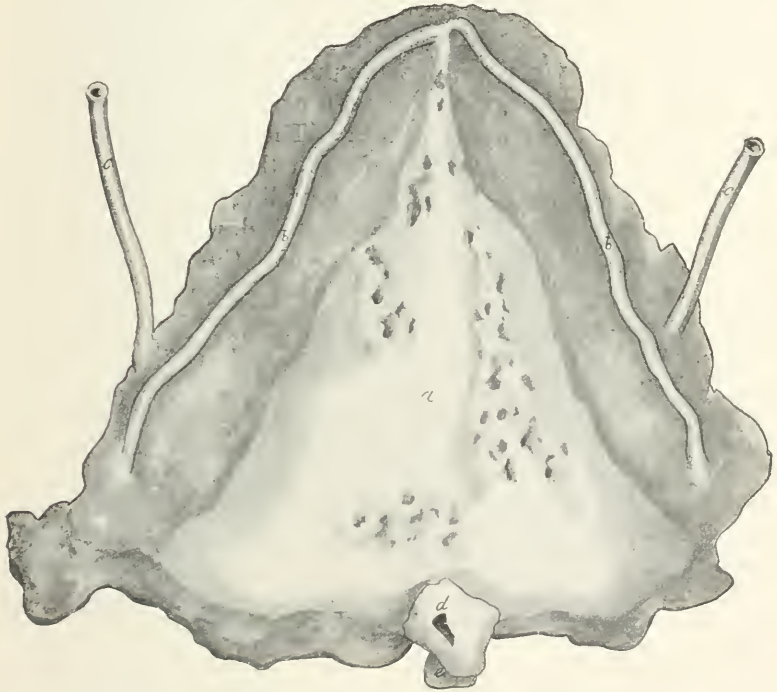
Fetal bladder from adult woman. a, the bladder ; bb, the umbilical arteries ; cc, the ureters; d, part of the vagina with the urethra.

Occasionally it happens that the cavity communicates with the bladder and opens in the umbilicus, forming a urinary fistula.   In new-born children it has been found to present its opening when the cord fell off.

The male sex is much more liable to this deformity than the female.   Of fourteen cases described in literature, twelve were found in boys,[1] which probably is attributable to the greater

[1] J. Veit: Handbuch der Gynäkologie, vol. i., p. 618.

length of their urethra and consequent greater liability to obstruction of this canal.

The specimen represented in the drawing differs from the above-mentioned class of cases by being closed at the umbilicus, and, on the other hand, by having preserved the full width of the bladder. In other words, the empty bladder extended up to the umbilicus. I found it in performing abdominal hysterectomy for a fibromyoma of the uterus on a 45-year-old virgin. Having incised the aponeurosis of the abdominal muscles, I noticed that there was unusually much connective tissue, but little fat, in front of the peritoneum. The umbilical arteries were seen as thick, solid, tortuous cords extending up to the umbilicus. Between them was found the bladder as a somewhat triangular body, extending nearly up to the umbilicus and bound to it by a short urachus. The wall was as thick as that of the bladder. As it lay just in the field of operation, I separated it bluntly from its surroundings, tied the top, cut it loose from the umbilicus, and pushed it down into the pelvis.

On the tenth day after the operation the patient died of nephritis, which enabled me further to investigate this rare specimen.

We must be careful not to confound this case with those, not so very uncommon, in which the bladder is grown to a tumor and carried into the abdomen in front of the tumor. In my case the relations to the uterus and its fibroid were entirely normal. The empty bladder simply extended to the umbilicus and was situated between the aponeurosis of the abdominal muscles, with the transversalis fascia in front and the peritoneum behind.

716 LEXINGTON AVENUE.

RUPTURE OF THE PUERPERAL UTERUS.[1]

BY

JAMES F. W. ROSS, M.D.,
Toronto.

IT is not my intention to discuss fully the subject of rupture of the puerperal uterus. I intend to throw together a few rambling notes in order to bring the matter up for your discus-

sion, knowing well that oftentimes active discussions are more valuable than the papers discussed.

It is a well-known fact that rupture of the uterus may occur before labor or during labor. The diagnosis of rupture of the uterus before labor must be extremely difficult; it is a subject about which I have no practical knowledge. The treatment of such a condition must depend upon the progress of the individual under discussion at the time. Rupture of the uterus during labor is, however, something with which every practitioner should be familiar, not, I trust, as a result of actual experience, but as a consequence of a close study of the subject in the class room.

The causes of rupture of the uterus are well known. It may be well to mention them. 1. Mechanical impediment to the course of labor, from whatever cause. 2. An increase in the size of the child to be delivered, from any cause. 3. Faulty presentation. 4. Undue compression of the uterine structures between the descending fetal parts and the pelvic walls. 5. Operative violence. 6. Unnatural violence of the uterine contraction, due either to the administration of ergot or morbid excitability of the organ. 7. Straining at stool. 8. Disease of the wall of the uterus itself, such as that produced by cancer, by atrophy, by softening, by fatty degeneration, by hydatid disease. 9. Unnatural narrowing, rigidity, or atrophy of the os uteri. 10. Abnormal development of the uterus. 11 (one that should come under the first class, of mechanical impediment to the course of labor, but is often put in a class by itself). Deformity of the pelvis. The operative violence more responsible for rupture of the uterus than any other is turning after the liquor amnii has escaped for some hours.

One of the cases of rupture of the uterus to which I was called was rupture produced by turning after the liquor amnii had escaped for some time from a primiparous uterus. The other operations required for the delivery of the parturient woman are occasionally the cause of rupture of the uterus. Taking all causes into consideration, version, under the circumstances just mentioned, produces fifty per cent of the ruptures of the uterus met with. Rupture of the uterus is said to occur in about one in three thousand deliveries.

The question as to whether rupture of the uterus occurs more frequently in first or in subsequent labors does not seem as yet to have been settled. Some claim that rupture of the uterus is more frequently met with in primiparous cases than

in multiparous cases. Others claim that it is more frequently met with in multiparous than in primiparous cases. Some state that rupture of the uterus may take place before the membranes have been ruptured. The duration of the labor has a great deal to do with the production of rupture of the uterus. The organ seems more prone to tear after it has become tired out by continual and prolonged contraction.

The fundus is less frequently ruptured than the body, and the body less frequently ruptured than the cervix. The posterior wall of the lower segment seems to be the commonest site of rupture, and the tear is generally found to run toward the left. The tears usually extend over a distance of three or more inches. It may occasionally happen that the peritoneal layer is not torn through, and in one such case that occurred in Toronto the fetus was delivered into the layers of the broad ligament and the patient made an excellent recovery. But even when the peritoneum has not been torn the patients may die after a prolonged course of septic poisoning.

Cases of rupture of the uterus may be divided into four groups. First, those that are beyond hope from the first, that have the usual classic symptoms of rapid pulse, dyspnea, precordial uneasiness, nausea, vomiting, and cold perspiration. Second, those cases that have, owing to delay, passed beyond the operable stage and have become ill with commencing septicemia and peritonitis, peritonitis and septicemia drawing attention to the case, and this extra attention revealing the fact that a rupture of the uterus has occurred and been present without giving rise to any early symptoms to indicate its existence. Third, the class of cases in which rupture is not immediately fatal, in which it is early recognized, and in which the patients are in good condition for operative interference. And fourth, a class of cases that I believe do occur, in which rupture is never recognized, but in which septic symptoms develop without any rhyme or reason. There is nothing to explain the onset of these symptoms.

In a case in which a very rapid pulse follows a fairly severe labor and peritonitis sets in, a partial rupture of the uterus must be considered when endeavoring to discover a cause for the abnormal course of the puerperium.

After leaving out the probable infection from the hands of the accoucheur, infection from latent gonorrhea, what have we that is likely to cause severe peritonitis after labor? May not unrecognized rupture of the uterus account for the onset of

peritonitis in many of these cases? The child is liable to be stillborn in any case of severe rupture of the uterus. If the fetus has escaped into the abdominal cavity, that cavity has become contaminated by meconium, by vernix caseosa, and the mother is scarcely likely to escape a fatal peritonitis.

According to some such classification we must direct our treatment. After rupture of the uterus has occurred the contractions of the uterus cease in a large proportion of cases. In some cases external hemorrhage is present. In some cases retraction of the presenting part takes place. In some, sudden severe abdominal pain is noted, and if the fetus has been delivered into the abdominal cavity the fetal parts can be felt through the abdominal walls. Under such circumstances there will be, perhaps, increased false movements of the fetus, followed by a cessation of such movements and a change in the shape of the abdomen and the uterus. The uterus and fetus each form a distinct tumor, and there is an intervening furrow that may be made out.

Intraperitoneal hemorrhage can often be diagnosed by percussion in the loins. I have diagnosed intraperitoneal hemorrhage by means of percussion in cases of ectopic gestation. The percussion sound may change, however, but slowly with the change of position, owing to the fact that the blood is clotted and that it changes its position more slowly than fluid does.

Since taking up this subject, in conjunction with lacerated and punctured wounds of the genital tract, before the Buffalo Academy of Medicine in January, 1898, I have met with two cases of rupture of the uterus.

CASE I.—I was called to the country to see a case in consultation. The patient was four months pregnant and had been losing blood, and was evidently threatened with a miscarriage. Unfortunately the books or the teachers give students the impression that it is necessary to empty the uterus for fear of septicemia as a consequence of the death of the fetus *in utero*. The doctor in attendance, a young practitioner, called another to his assistance, and together they decided to dilate the cervix and empty the uterus. This was carried out under an anesthetic. The patient did not do well; complained of intense pain and burning in the abdomen; began to vomit. The temperature became elevated and the pulse rapid.

When I saw her she had an anxious expression of countenance and looked extremely ill. I was informed that there

was a peculiar condition existing, and that the case must be one of bicornuate uterus, as there was a place to the left side into which the finger would readily pass. I decided, notwithstanding the condition of the patient, to make a thorough exploration under an anesthetic. The fingers were then passed into the vagina, and two fingers were passed out through a rent on the left side of the uterus just about the situation of the internal os. As soon as they were passed into the abdominal cavity grumous, foul-smelling blood exuded. The conditions were not favorable for the performance of a celiotomy. A nurse could not be obtained within less time than twenty-four hours, and the patient's condition was such as to scarcely justify abdominal operation. I cut off a portion of the tubing on a large rubber douche bag, stitched two pieces together, one much shorter than the other, and passed them up through the cervix, through the rent in the uterine wall, into the abdominal cavity. The outer end of the short tube remained inside the cervix, and that of the other tube came down and ended at the vulvar orifice. Through this I washed fluid from the douche bag, allowing only of a gentle flow and watching carefully the return. Iodoform gauze was then packed around the tube into the vagina, but was not carried into the cervix for fear that the tubes might be disturbed at the first dressing. A nurse was immediately telegraphed for and arrived next day, and for several weeks the pelvic cavity was irrigated. The temperature gradually fell, the pulse dropping with the temperature. The patient made a slow convalescence, but ultimately regained perfect health.

I met with another case similar to this and reported elsewhere. The uterus was ruptured by the hand of a practitioner. A plate representing the rupture is to be found in THE AMERICAN JOURNAL OF OBSTETRICS, vol. xxxvii., No. 4, 1898. It might be inferred from the note underneath the plate that I had done a posterior vaginal section. This is not so. The abdomen was opened, gauze was passed down through the rent into the uterus, on into the vagina, and a drainage tube was placed in the cul-de-sac of Douglas from the front. At the commencement of the operation the abdominal cavity was thoroughly flushed and all blood clots were carefully removed. The gauze, passed through the rent on the posterior surface of the uterus, was cut level with the serous membrane covering it. The patient made an easy recovery.

CASE II.—Mrs. H., æt. 38. For the following history I am

indebted to Dr. McPherson, who attended the patient and sent her into the hospital under my care.   When the doctor arrived he found that the patient had been in labor for five hours. She had had several children.   The pains were very severe, but there did not seem to be much contraction of the uterus. The os was dilated and the cervix soft, membranes protruding. On inquiry the doctor found that there had been no motion of the child felt for about a week.   Child was in the first position.

Two hours after the arrival of the doctor, or seven hours after the commencement of the labor, the patient cried out that she was dying and complained of sharp pains in the left side. What little uterine contraction there had been ceased altogether.   The patient was given chloroform, forceps applied, and the child was delivered without difficulty.   The child was dead and macerated; had evidently been dead for some time. Before the forceps was applied the pulse was 120; it rapidly rose to 140, temperature 99°.   There was no difficulty experienced in the delivery of the placenta.   Though it looked green, it did not smell badly.   About five hours after delivery, pulse 120, temperature 99°.   Next morning pulse 124°, temperature 99°.   Patient suffering from very acute pain in the abdomen. She was particularly tender on the left side.

As the condition did not improve, a consultation was called, and it was decided to again place the patient under chloroform and explore the uterine cavity to ascertain the cause of the patient's condition.   The temperature had now reached 101°.

Dr. McPherson passed his hand into the abdominal cavity through a rent of the cervix and vaginal vault on the left side. He found that his fingers were over the fundus of the uterus, surrounded by blood clot.   The consultant also made sufficient examination to satisfy himself of the existence of a ruptured uterus.

The pelvic cavity was then douched thoroughly with hot water and packed with iodoform gauze through the rent.   The douche and the packing were repeated daily.

On the ninth day, or the third day after delivery, the pulse was 118 and the temperature 102.2°.   The pain was very severe over the abdomen and required a large quantity of morphia to relieve it.   Pains then came on in the calf of the left leg.   These were apparently produced by cramps of the muscles.   The condition continued about the same on the fourth, fifth, sixth, and seventh days after delivery.   On the eighth day

the pain in the left leg became very severe and the leg became swollen; the veins appeared to be much distended. There was slight hemorrhage from the vagina, bright red in color, after the removal of the packing.

On the ninth day there was severe hemorrhage from the vagina. Pulse rose again to 120. Hemorrhage was checked by hot douche. On the tenth day pulse 124, temperature 100°. On the eleventh day pain came in the calf of the right leg, and it was quite evident that phlebitis was now coming on in the right limb. Both legs were bound up in cotton and kept quiet. The patient remained in about the same condition for the twelfth, thirteenth, fourteenth, and fifteenth days. As it was impossible to give her the necessary attention, she was moved into St. Michael's Hospital under my care.

She lay for several weeks with high fever, rapid pulse, and all the evidence of a profound septicemia. As she had double phlebitis it was necessary to put her on a water bed. I despaired of her life, and on several occasions thought she would scarcely survive the night. She gradually began to improve, and after a slow convalescence regained her health. I have never seen a patient make a recovery after having been so ill.

A case of rupture of the vagina, with extrusion of the fetus and placenta into the abdominal cavity, has come under my care, but cannot be considered here as it is not a case of rupture of the uterus. It has already been reported in THE AMERICAN JOURNAL OF OBSTETRICS, vol. xxxvii., No. 4, 1898.

Treatment.—As I have already indicated, the treatment must be taken up according to the class of case met with. In the first class of cases no treatment will avail. The patient is practically moribund before the physician in charge is able to call counsel around him. The hemorrhage and shock prove fatal in but too short a time.

In the second class of cases, in which there are no symptoms to indicate that rupture of the uterus has occurred, in which it is late before the actual condition is discovered, the treatment must vary from that to be carried out in the next classes. The treatment in this second class must be that indicated in the cases reported—namely, thorough drainage and thorough cleansing from below. I cannot see that anything but evil can result under such circumstances from an abdominal operation. Adhesions of intestine that have already been formed to protect the general peritoneal cavity must be broken down, and the danger of a general infection as a consequence be increased.

I feel, therefore, that the golden opportunity having slipped by, we must be satisfied to allow the septicemia to proceed and deal with the case on conservative lines. I have reported two cases that have recovered through this line of treatment.

In the third class of cases, in which the rupture is recognized, in which the patient is not moribund from shock and hemorrhage, there can be, to my mind, only one line of procedure, namely, a thorough inspection of the part through an abdominal opening, a removal of blood clot from among the intestines, a thorough stoppage of hemorrhage from the wound either by approximating sutures or gauze packing, and the establishment of thorough vaginal and abdominal drainage. I have reported one such case with an easy recovery.

To my mind, suturing of the rent is scarcely called for. It prolongs the operation, and this is of great importance under the circumstances. Any one who has had practical experience with this tragedy of the lying-in ward must have noticed that the edges of the wound are so bruised as scarcely to hold a suture. To pare them off means an increased hemorrhage and, as a consequence, increased delay. I therefore prefer to pack with gauze, and am satisfied that the uterus afterward becomes perfectly normal. The doctor on whose patient I operated in this way told me that on subsequent examination he found her pelvic organs in a perfectly normal condition. To perform a hysterectomy under such circumstances must prolong the operation, increase the shock, and unsex the patient.

The treatment of the fourth class of cases must bring up for our consideration the question of diagnosis of uterine rupture and uterine puncture. How are we to learn how to discover this condition when it exists without the presentation of any early symptoms? When the symptoms of inflammation and septicemia set in it is too late for us to make a diagnosis. I believe it would be wise, in one class of cases I have mentioned above, in which the pulse is abnormally rapid when compared with the slight difficulty of the labor, to explore the cavity of the uterus thoroughly with the finger in order to ascertain the presence of any rupture. I have removed placenta from the interior of the uterus so frequently six, seven, eight days after delivery, and where neither hemorrhage nor odorous discharge indicated its presence, after the woman has become profoundly septic, that I differ in my opinions from the ordinary teachings of the text books. I do not look upon the interior of the uterus

as a sort of sacred inner chamber into which the finger of the accoucheur should seldom enter.

Whenever I am called to see a case of septicemia following labor, I insist on making a thorough exploration of the interior of the uterus with the finger, either with or without the use of an anesthetic. I feel satisfied that retained placenta is a very frequent cause of such septicemia, and that no living accoucheur can feel and see a placenta and say that it is beyond a doubt intact after it has been expressed from the uterus. If, then, the thoroughly sterilized finger of the accoucheur is forced to hunt about in the uterus for retained placenta on the seventh, eighth, or ninth day after labor, why should this search not be instituted earlier?

I do not believe that, given a vagina free from the gonococcus and a thoroughly disinfected finger, there is any danger to the woman from the introduction of the finger into the uterine cavity. Holding these views, I feel, therefore, that when the faintest suspicion of rupture of the uterus exists, a thorough exploration of the interior of the organ should be carried out, in order that the patient may have the benefit of early treatment.

A few years ago the uterine sound was looked upon as an instrument likely to be followed by bad symptoms. When we discovered that it was not the uterine sound that did the damage, but the disturbance of adherent pus-containing tubes, we learned how to avoid the danger. So it is with exploration of the uterus after delivery of the afterbirth. We can learn how to avoid the danger. There is no reason why the handling with a clean finger of the placental site should be any more dangerous than the handling of any other wound. I have explored the interior of the uterus a great many times and have never met with any untoward results, except in one case in which gonorrhea was present and I was not aware of the fact.

In a case I have previously reported of rupture of the uterus by the hand of the practitioner, the rupture would not have been discovered had not the attendant been suspicious that something happened. He instituted an examination and found intestine in the uterine cavity.

The portion of the treatment for rallying the patient has not been touched upon. You are all familiar with the usual routine, consisting of the intravenous saline solution, submammary saline solution, direct transfusion. In the first class of cases no such treatment will avail; death occurs too soon. In the

class of cases that have recovered, such as those that I have recorded, this treatment was not found necessary.

And, finally, I may say that there is one point firmly fixed in my mind, namely, that when rupture of the uterus has been discovered within twenty-four hours after its occurrence, and the patient is not moribund, the abdomen should be opened, the abdominal cavity should be thoroughly cleansed, hemorrhage should be checked, and drainage instituted.   The operation must, of course, be carried out with every aseptic detail. I am satisfied that such treatment will give the best results.

A CURETTE FOR CERVICAL CANCER.

BY

HOWARD A. KELLY, M.D.,
Baltimore, Md.

(With illustration.)

No curette in my possession has proved perfectly satisfactory in the removal of the redundant carcinomatous tissue in cases of cancer of the cervix. As a rule, after a thorough curettage with any of the dull or sharp scoops, I still find that I can remove more tissue with the nails of my index and middle fingers.

I have, therefore, devised the following curette, which serves my purpose better, removing all available tissue with a minimum risk to the adjacent structures.   The instrument may be described as made up of three parts, a large, stout handle affording a comfortable grasp for the entire hand, and a stout shank which tapers to a long and rather deep bowl.   This bowl, which is the curette proper, is ovoid in form with a blunt margin, surrounded by crenations a little coarser than shown in the figure.

I use the curette by grasping the handle firmly with the right hand, while the left index finger, introduced into the vagina, serves to control the crenated bowl, which is then vigorously employed to remove—that is to say, to tear away —the diseased tissues.   The crenations, which form the essential feature of the instrument, take hold of the tissue in a way no other blunt instrument will do, and if the force is exerted with

good judgment there is no risk of thrusting the bowl beyond the limits of the disease. It is my practice to proceed quite rapidly in scooping out and breaking down the more superficial portions of the disease, and then to advance with greater caution in the direction of the peritoneum, rectum, or bladder, repeatedly endeavoring to ascertain by means of the index finger the exact thickness of the tissues remaining in the septum.

The only other instrument to which I am aware the curette bears the slightest resemblance is Thomas' spoon saw, used at one time by that eminent gynecologist in the enucleation of fibroid tumors; the resemblance here is, however, only superfi-

cial, for the differences could scarcely be greater. The spoon saw is a shallower, broader instrument, with sharp recurved teeth; its margins are not sinuous or crenated as in my curette. The spoon saw, in other words, is a cutting instrument designed to work in sound tissues, while the curette is a tearing, scooping instrument for diseased cancerous tissues.
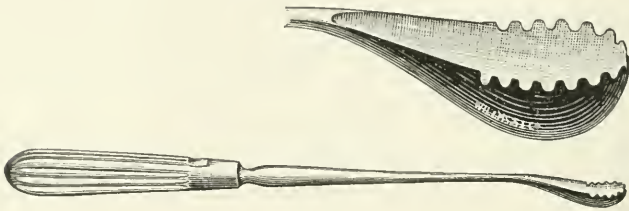
The measurements of the larger instrument are as follows: total length, 25 centimetres; handle, $9\frac{1}{2}$ centimetres; shank, $11\frac{1}{2}$ centimetres; bowl, 4 centimetres. The width of the bowl is 17 millimetres, and the depth 14 millimetres. There are ten crenations, 2 millimetres in height and $2\frac{1}{2}$ millimetres in width at the base. The upper figure shows the size of the bowl of the larger curette; the lower figure gives the general appearance and proportions on a scale about one-third. The measurements of a smaller curette, which is sometimes used, are two-thirds those of the larger curette.

TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

PROCEEDINGS OF THE TWELFTH ANNUAL MEETING, HELD AT INDIANAPO-
LIS. INDIANA, SEPTEMBER 19, 20, AND 21, 1899.

The President, EDWARD J. ILL, M.D , *of Newark, in the Chair*.

First Day—Morning Session.[1]

WHAT SHALL WE DO WITH THE POST-OPERATIVE HEMORRHAGE OF CELIOTOMY?[2]

This was the title of a paper read by DR. D. TOD GILLIAM, of Columbus, Ohio.

DR. CHARLES A. L. REED, of Cincinnati.—I confess that where I observe symptoms unmistakably indicative of internal hemorrhage I want to get at the bleeding point as quickly as possible. I recall a case some years ago from whom I removed enormously distended pus tubes. Fortunately I put in a drainage tube, and presently the nurse began to pump out considerable quantities of blood. The patient began to show the loss of blood. I reopened the wound, found the pedicle perfectly satisfactory, but in the careful enucleation I wounded a branch of the mesenteric artery away up under the mesocolon, which had eluded my attention at the time of the operation. The woman rallied without any untoward symptoms.

DR. H. W. LONGYEAR, of Detroit.—There is nothing more puzzling to me than to know just what to do in a case which shows the condition of collapse which has been described as indicative of internal hemorrhage; and yet there are other conditions which produce the same symptoms, and we have got to use fine discrimination. If we know there is a bleeding vessel it is our duty to cut down and tie it. I do not care what the condition of the patient is. Just as in the case of a ruptured tubal pregnancy, when we know there is internal hemorrhage going on, it is our duty to reopen and do the best we can. I recall a case in which I reopened the abdominal wound and was unable to locate the source of the hemorrhage. The woman died soon afterward. A postmortem examination revealed an antemortem heart clot.

DR. RUFUS B. HALL, of Cincinnati.—It occurs to me that in many of these cases hemorrhage or shock can be determined largely by the operator himself. We are well aware, when we

[1] Continued from p. 733. November JOURNAL.
[2] See p. 636, November JOURNAL.

put a patient to bed after an operation, whether there is likely to be secondary hemorrhage or not. If the operation has been a complicated one, if a condition has been left where we have great risk of hemorrhage, this would aid us materially in determining whether or not the patient was bleeding or suffering from shock. In a case of hemorrhage following laparatomy I would not hesitate to remove a stitch or two, if the abdomen is closed without drainage; and without very extensive exploration I think I could determine readily whether hemorrhage was taking place or not. If bleeding is taking place it is our duty to give the patient the chance that she has by tying the vessel. It is true, some of them will die, but others will not. I have had some gratifying experiences in saving the lives of patients from hemorrhage following abdominal section.

DR. L. S. McMURTRY, of Louisville.—In the early days, before our operative technique was improved as it is now, the drainage tube was almost universally used, and it was common at the end of twenty-four or forty-eight hours to have great quantities of blood pumped out of the tube. Hemostasis was not as thorough; it did not comprise the small vessels that are now ligated so carefully. The vessels should be tied separately, and whenever possible the ovarian artery should be secured well over on to the side of the pelvis, in operations for the removal of the uterine appendages, and mass ligatures should not, when it can be helped, be left.

DR. J HENRY CARSTENS, of Detroit.—With reference to medication in shock, I believe in the efficacy of atropine or belladonna. I use it in preference to strychnia.

DR. JAMES F. W. ROSS, of Toronto.—We have two classes of hemorrhage—hemorrhage shortly after operation, and hemorrhage which occurs three or four or five days subsequent to operation.

Regarding immediate hemorrhage, I cannot emphasize too strongly what Dr. Hall says, namely, taking out a stitch and introducing a long silver probe in different directions, to determine if there is bleeding. In one case I did not reopen the abdomen of the patient, and she died of peritonitis. No hemorrhage was found. In another case I found hemorrhage, tied the bleeding vessel, and she recovered.

DR. L. H. DUNNING, of Indianapolis.—I am forced to believe in shock in some instances. I have seen it occur twelve, twenty-four, and thirty-six hours after operations. I have seen patients recover from it who would not have recovered from hemorrhage. A valuable diagnostic sign is an irregular capillary circulation, or congestions here and there. I recall three or four cases in which I spent hours at the bedside of patients, hesitating between hemorrhage and shock, and on the appearance of localized spots I have decided it was shock and did not reopen the abdomen. The patients recovered. A purple ear or purple lip, or a spot upon the face, is indicative of shock and not internal hemorrhage.

DR. X. O. WERDER, of Pittsburg.—One rule in patients suf-

fering from secondary hemorrhage is that they have a rapid pulse, lowered temperature, restlessness, etc. I believe the temperature is not important. An even rise of temperature should not interfere with reopening the abdomen of the patient. I have seen this in two cases. In one the temperature was 102.8°, and in a recent case it was 102.5° and the pulse scarcely perceptible. The pulse, therefore, is important, and if it gradually rises ten beats or more after operation you may conclude that you have hemorrhage, no matter what the temperature is. My rule is that as soon as I suspect a hemorrhage I take out a stitch, reopen the abdominal wound, and tie the bleeding point without an anesthetic.

DR. EDWIN RICKETTS, of Cincinnati.—Whenever ligatures are used there is one procedure I wish to refer to, one that is always resorted to by Bantock—namely, crushing the tissues for a half or a quarter of a minute by a heavy jaw clamp. After the clamp is removed the ligature is applied.

DR. WILLIAM H. HUMISTON, of Cleveland.—Dr. McMurtry hit the nail on the head when he spoke of tying each vessel separately and carefully, and I think it is unnecessary to have secondary hemorrhage, provided we care for the bleeding points at the time of the operation. I do not believe in using the *en masse* ligature in removing the appendages. Each vessel should be caught separately and tied with fine catgut or silk, reinforced by seizing the ovarian artery as it comes off the pelvic wall, inserting one stitch in it and one near the cornu of the uterus. By doing this we need not have secondary hemorrhage.

First Day—Afternoon Session.

DR. ROBERT T. MORRIS, of New York, spoke on

COCCYGEAL DERMOID FISTULÆ.

The subject of coccygeal dermoid fistulæ is apparently one that has not received very much attention, as he finds little reference to it in medical literature. Occasionally some one has reported the finding of a dermoid cyst in the coccygeal region, but without making comments on the derivation or the manner in which such cysts are likely to have been formed. He has seen reference to cysts only, but in making a study of the subject he finds that we are much more apt to find fistulæ than cysts. We are more apt to have fine depressions than fistulæ. We have, then, in the region of the coccyx, not infrequently funnel-shaped depressions of the skin. We have less frequently fistulæ extending to a depth of from half an inch to four inches in his deepest case, and we have still less frequently wholly encapsulated cysts. These fistulæ and cysts contain straight hairs of the lanugo type mostly, although he has seen some nearly three inches in length, straight, in a mass, and welded together by sebaceous material. The sebaceous mate-

rial escapes in large quantities from the fistulæ. It remains encapsulated in the cysts and in the funnel-shaped depressions; it frequently dries upon the surface, and comes away in the form of scales mixed with epidermis.

When his attention was directed to the subject about a year ago, he was surprised at finding the proportion of cases in which we have these funnel-shaped depressions or fistulæ, or cysts of the coccygeal region, or dermoid cysts. It evidently represents an embryonal defect. There is a possibility that the tail of the embryo in undergoing involution leaves a portion of the skin highly endowed with embryonal latent cells, and that the skin, developing more perfectly in the connective tissues about it, encapsules in part or in whole this absorbing or involuting embryonal tail, so that we have in the coccygeal fistula really an inverted tail.

He has had 4 cases of coccygeal fistulæ containing masses of hair in his own practice up to the present time.

In trying to eradicate them the surgeon must remove the entire cyst wall or fistula wall, because it consists so largely of embryonic tissues that the growth recurs unless it is thoroughly removed. The method of treatment with nitrate of silver and with caustics will result only in temporary destruction of the inner layer, just as when we try to destroy a branchial cyst or branchial fistula we have a recurrence very promptly from the deeper layers of embryonal cells, the latent cells forming the structure again, so that entire removal is necessary.

In the case of which he showed specimens the man was 23 years of age. He had not been aware of the presence of anything wrong in the coccygeal region until about two years previous to the time Dr. Morris saw him, when he was kicked, and following the kick a small tumor-like mass developed in the coccygeal region, and the patient's physician brought the case to Dr. Morris on the supposition that injury had been done to the bone and that it was a case of necrosis of the bone of the coccyx. But he recognized the disagreeable odor of the sebaceous fistulous secretion, found two or three hairs projecting, and dissected out the fistulous tract to the extent of three inches. The coccyx in this region in this case, as in most of the cases, was deformed; but he is not at all sure that this observation is correct, for the reason that he has not seen a sufficient number of cases and he has not had an opportunity to examine post mortem any coccyx in which there were present coccygeal fistulæ, a cyst, or funnel-shaped depressions of the skin.

DR. EDWIN RICKETTS, of Cincinnati, Ohio, read a paper on

HOUSE-TO-HOUSE OPERATING.[1]

DR. WALTER B. DORSETT, of St. Louis.—The greatest of men are known by their simple ways of expressing themselves, and the greatest of surgeons by their simple way of operating,

but in the consideration of the subject before us there are many points that should not be overlooked. In the first place, we cannot maintain the discipline in a private house that we can in a hospital, whether we have a trained nurse or not, because the relatives of patients are always coming in, and they have a certain influence over the patient. The nervous system of the patient is more or less disturbed and her recovery in a great measure retarded. On the other hand, I am willing to admit that in the hospital a great many things are done that should not be done. Cleansing the hands by different methods is entirely unnecessary. There is harm done by the bichloride pack. I believe green soap, and plenty of it, with hot water is all that is necessary.

Dr. J. Henry Carstens, of Detroit.—I am sorry that this paper was read. I think the author's views are vicious and pernicious. He is trying to teach us something that ought not to be taught, and when this paper is circulated among general practitioners they will simply laugh at aseptic and antiseptic surgery, and say, "What is the use? It does not do any good to follow aseptic precautions," etc. I deprecate the belittling of aseptic precautions, and I must emphatically protest, because such a paper will have a demoralizing effect on the whole profession.

Dr. William H. Humiston, of Cleveland.—I cannot believe that Dr. Ricketts is serious in all the points he has made. Any one who has seen Tait operate knows that he is the perfection of cleanliness. Bantock is also one of the most cleanly of operators. These men believe in cleanliness. Personally, I prefer to have my patients in a hospital, as I believe we get better results and a lower mortality.

Dr. Willis G. Macdonald, of Albany.—Dr. Ricketts is mistaken when he speaks of the presence of antiseptic surgeons and antiseptic surgery. The day of the purely antiseptic surgeon and of antiseptic surgery has now passed at least ten years. There are few men who are doing much surgery in this country who make use of chemical agents for the purpose of sterilization. The system of operating has entirely changed in that respect. I find that people in the State of New York are beginning to appreciate what a good hospital really means; they appreciate what a good training school for nurses means; they appreciate that they can be made much more comfortable, and their chances of recovery are immeasurably increased, by going to hospitals instead of remaining at home to be operated. And even accepting that the mortality is not greater and that the chances of infection are not greater in a private house. I do not see that Dr. Ricketts has presented anything to us that we can take away as a guide for conducting operations in a private house anywhere.

Dr. Rufus B. Hall, of Cincinnati.—If the essayist had confined his paper largely to emergency surgery I should not have taken issue with him. I believe a certain amount of emergency surgery must and ought to be done in private

houses, in a hotel, a boarding house—any place where the patient happens to be. To make these places a choice for operation is wrong both for the patient and the profession.

DR. JOHN M. DUFF, of Pittsburg.—I should be sorry indeed to have the dictum go out that we can do just as good work and get as low a mortality from house-to-house operating as we can in well-equipped hospitals. If this were true, the lazy and ignorant members of our profession would have an excuse for not doing their full duty in the line of antisepsis and asepsis.

DR. ROBERT T. MORRIS, of New York.—I had not intended to take part in this discussion. I can train three assistants so as to get my death rate down to almost nothing, but I cannot train six or nine or twenty physicians, who are in charge of so many cases at one time, to give me the statistics that are creditable for a report. This matter has to be settled by statistics after all. The only statistics I recall at this moment are that I have lost 11 appendicitis patients. Of this number 2 died in hospitals and 9 in house-to-house operations. The operations in hospitals were certainly more than five times as many as those in private houses.

DR. JAMES F. BALDWIN, of Columbus.—I believe Dr. Ricketts said Dr. Dunlap's mortality from house-to-house operating was about fifteen per cent. I wish to differ with him. I do not think it could be represented by three times fifteen per cent, and I make this statement after having had a conversation with Dr. Dunlap some years before his death. He never kept any statistics, and I have long since learned that the general practitioner who keeps no statistics and has a large number of obstetrical cases with a small death rate from all sources is unreliable.

DR. RICKETTS (closing).—If there is anything I love it is a spirited discussion, and I have certainly had it here. The reason why I read this paper is that, in looking over my cases, the most difficult operations that I have had to do have been done in patients' homes. I believe I am right, but one of the speakers said he does not know whether to believe what I say or not. I want to say to him I believe what I have said from the top of my head to the bottom of my feet. If I can obtain as good results from house-to-house operating as in hospitals, I have a right to speak along this line. I did not expect to have any of the Fellows come to my rescue this afternoon. Lastly, the fuss and feathers of surgery have got to go; and so far as taking care of patients is concerned, they can be cared for as well in their own homes by house-to-house operating as in well-equipped hospitals. House-to-house isolation means a great deal. There is risk of room-to-room infection in hospitals. The only case of erysipelas I ever had was in a hospital after an operation. I want to say that ten years from now you will find the pendulum, which has been swinging so far out, will swing back to the centre of common sense and cleanliness.

Dr. William H. Humiston, of Cleveland, Ohio, read a paper entitled

PRIMARY SCLEROSIS OF THE OVARY.[1]

Dr. Frederick Blume, of Pittsburg, Pa., followed with a paper entitled

INTESTINAL ADHESIONS IN SUPPURATIVE DISEASE: THEIR SIGNIFICANCE AFTER VAGINAL HYSTERO-SALPINGO-OÖPHORECTOMY.[2]

Dr. W. E. B. Davis, of Birmingham.—This question hinges largely upon whether the uterus shall be preserved or not. French surgeons concede that it is best to remove the uterus, and if we accept it as the best practice in cases where the appendages are removed, then the vaginal operation has a much wider field than it has hitherto held in this country. But if the uterus is to be preserved, then the abdominal route must be the rule and the vaginal the exception. Without doubt, in those cases where we have puerperal abscesses, not gonorrheal, where the abscess is peritubal, the vaginal route furnishes a great field for the proper treatment of such cases. As a rule, the vaginal route should be adopted for abscesses not confined to the appendages, and the abdominal route with the Trendelenburg position will enable us to reach the other cases better than any other method of operating.

Dr. Willis G. Macdonald, of Albany.—There are a number of surgeons who believe that not all of the good surgery that has ever been done upon pus tubes and collections of pus has been accomplished through an abdominal incision. There are a considerable number of surgeons, doing a fair amount of work, who are becoming convinced more and more that they can do good surgery and get cures by operating through the vagina. Not all cases of pyosalpinx, or perhaps half of them, are suitable for the vaginal route, and there are other cases in which I am just as earnest in saying that they should be attacked through an abdominal incision. Ovarian abscesses holding four or five ounces of pus are much better removed through the abdomen and the whole sac enucleated with them.

Dr. T. A. Reamy, of Cincinnati (by invitation).—It has been my custom for years, if complications existed above, where there was a large amount of pus in the pelvis, not to break up the adhesions, but protect the general peritoneal cavity by allowing the intestines to remain adherent, even in cases where the tubes have been extensively involved, emptying the pelvis from below. Two ends are served by not breaking up the adhesions: first, the descent of the small intestines into the large cavity is prevented by the existing adhesions; secondly, the admission of pus into the general peritoneal cavity is prevented.

Dr. Blume (closing).—I tried to prove in my paper that the

intestinal adhesions with pelvic complications are not so dangerous as some physicians would have us believe. I have never seen a case from one of my Pittsburg colleagues where the uterus and appendages had been removed through the vagina, nor have any of them seen a case of mine. If such a thing does not occur in about three hundred cases it shows that the ultimate results must be satisfactory. I tried to show further that there is no one route through which to attack these cases. It is a serious matter for any surgeon to adhere to one route to the exclusion of the other at the present time. The only way to get rid of the great mortality from the abdominal operation is to differentiate between the various forms and stages of the disease.

First Day—Evening Session.

This session was devoted to the exhibition of pathological specimens, of which the operators gave brief histories, and short discussions followed. Numerous photographs were passed around in connection with the presentation of specimens.

Second Day—Morning Session.

The following three papers were read and jointly discussed

1. SHALL WE ABANDON VENTROFIXATION OF THE UTERUS ?[1]

By DR. WALTER B. DORSETT, of St. Louis, Mo.

2. TWO CASES OF DYSTOCIA FOLLOWING VENTROFIXATION, ONE REQUIRING CESAREAN SECTION.[2]

By DR. X. O. WERDER, of Pittsburg, Pa.

3. A SIMPLE, EFFECTIVE, AND ESTHETIC OPERATION FOR SHORTENING THE ROUND LIGAMENTS.[3]

By DR. H. W. LONGYEAR, of Detroit, Mich.

DR. D. TOD GILLIAM, of Columbus, described the operation of Dr. Kellogg, which, he said, was essentially that outlined by Dr. Longyear in his paper, with a few modifications.

DR. WILLIAM H. HUMISTON, of Cleveland, believes in ventrofixation, and has had some excellent results from it. His method is not quite as complicated as Dr. Dorsett's, for the reason that he uses but one suture to hold the uterus, but which is inserted in the same manner as described by Dr. Dorsett. In addition, the speaker scarifies the anterior surface of the uterus for about three-quarters of an inch, and the suture embraces three-quarters of an inch of the uterus. One suture is sufficient to hold it with scarification, which will give quite firm union. It is necessary, however, to support the uterus a short

time with a pessary. He has no use whatever for the Alexander operation, believing that there are no indications for it.

Dr. James F. W. Ross, of Toronto, does not care for the Alexander operation, for obvious reasons, but prefers the intra-abdominal operation.

Dr. Joseph Eastman, of Indianapolis, believes in ventro-fixation, and not ventrosuspension, and, in order to get good fixation, within the last few years he has been using for his fixation stitch heavy silver wire, which he passes through all the layers of the abdominal wall. He leaves this wire in from six to eight weeks. This obviates the necessity of a pessary. He has had only one bad result, and this was in a case where he was furnished with silver-plated copper wire instead of genuine silver wire, and in removing the dressings the wire was broken off and the uterus fell back, not completely, but further than it should have done had the wire remained the proper length of time.

Dr. J. Henry Carstens, of Detroit, stated that he did not get those cases of simple retroversion of the uterus that can be cured by an Alexander operation. He did not suppose that he got one such case a year. The class of cases that came under his care mostly were those with diseased tubes, adhesions, complications, etc. In these one could not resort to the Alexander operation. Simple cases of retroversion can be properly cared for by the general practitioner with tampons, pessaries, etc.

Dr. L. H. Dunning, of Indianapolis, believes in ventro-fixation because it gives more permanent results, and because in his practice it does not interfere with pregnancy. Of quite a large number of cases, something over a hundred, there have been four pregnancies, the deliveries being effected without any difficulty whatever. He believes it is a mistake to introduce a stitch through the uterus back of the centre of the superior surface of its fundus; it ought to be in front of the line, and the scarifying of the uterus ought to be below the line of insertion of the stitch.

Dr. T. A. Reamy, of Cincinnati, spoke with reference to the operation of shortening the round ligaments, and said the patient should wear a pessary for several months after the operation.

Dr. M. Rosenwasser, of Cleveland, thought there was more surgery done than ought to be in the class of cases under discussion. He believes that the simple cases of retroversion, etc., can be treated successfully with a pessary without operation.

Dr. Frederick Blume, of Pittsburg, stated that an ideal method of treatment in cases of retroflexion and retroversion would be the shortening of the ligaments, and whether this could be done by the method described by Dr. Dorsett or not he did not know. He did know, however, that a great many cases have resulted in failure where the Alexander operation was done.

Dr. John M. Duff, of Pittsburg, believes that many cases of retroverted uteri can be greatly relieved, if not cured, by manipulation and massage of the uterus. Time and again he has had cases come under his care in which operation was advised but declined, and by manipulation and careful position on part of the patient, keeping the bowels regular, preventing tenesmus, etc., he has relieved them very materially. He believes there are hundreds of women whose uteri are retroverted, yet they are not doing them any harm.

The discussion was closed by the essayists.

Dr. Charles A. L. Reed, of Cincinnati, Ohio, delivered a memorial address on

THE LIFE AND CHARACTER OF LAWSON TAIT.

This distinguished surgeon, the son of Archibald Campbell Tait, was born at Edinburgh, Scotland, May 1, 1845. His father was a guild brother of Heriot's Hospital, into which institution the son was admitted as a foundation scholar at the early age of 7 years. In this humble institution he early showed those traits of mind which enabled him to win a scholarship in the University of Edinburgh, and which characterized his subsequent brilliant career. We are informed that he did not graduate at this latter institution, although he studied in the departments of both the arts and medicine. Those who were students with him in this great institution remember him as a lad of great aptitude, but with comparatively little continuity of application. He was fond of those diversions which appeal with such force to vigorous young manhood. As a consequence he found the prescribed tasks very irksome and the imposed discipline very annoying. He is reported as having been more intimately acquainted with the proctor than with any other officer of the institution. But his expanding and virile mind could be no less active than his vigorous body. The themes which engaged his attention, however, were those which occurred out of the ordinary routine. The great work of the Darwins was then creating a storm centre in the scientific, to say nothing of the religious, world; and Huxley and Spencer were commanding alike the anathemas of the ecclesiastics and the plaudits of reactionary thinkers. It was to the latter class that young Tait belonged, and continued to belong during his whole life. His devotion to the new philosophy brought him into antagonism with the orthodox thought that then dominated, as it yet dominates, this great seat of learning. It was in these controversies that he developed and displayed much of that polemic tendency and forensic power which in subsequent years proved at once his strength and his weakness. But the nature of the subject that constituted the basis of these early controversies was such as to direct his attention to the more rational methods of study and investigation. Following the lead of Darwin, he early learned to study things rather than words. There never was a time when he

was not more attracted by an object itself than by the most artistic description of it. He early acquired the habit of translating words into ultimate conceptions—a habit which in subsequent years made him a severe and formidable critic for loose thinkers and careless writers.

It was precisely this preliminary training that fitted young Tait for the most successful prosecution of his medical studies. His pupilage in the medical school was in the essentially didactic era of medical teaching. Learned lectures prepared entirely with reference to doctrine and diction were the dominant features of instruction. The laboratories, with their heartless iconoclasm, scarcely yet had a footing. Personal authority was not yet dethroned. The dictum of the professor was yet accepted over and above demonstrated facts of contrary significance. Against this order of things young Tait, with great love for truth, but with no profound reverence for men, naturally found himself in revolt. In the medical school he was attracted and influenced by men who were already breaking away from the thraldom of tradition. Over and above the others of the class was the illustrious Sir James Y. Simpson, to whom the subject of our sketch sustained the relation of a special pupil and later that of assistant. He was also profoundly influenced by the teachings and the example of Syme, whose habits of cleanliness in his surgical work and whose results were in happy contrast with the methods and results of others connected with the Royal Infirmary. He was also an assistant to Sir Henry Littlejohn, and took special instruction from Mackenzie Edwards. During this time he gave particular attention to the various biologic studies, and particularly to investigations by the microscope—an instrument which, in the early sixties, did not occupy the prominence in scientific work that it does to-day. This early habit had a pronounced influence on his subsequent professional career, which really began at the early age of 22.

After taking his L.R.C.P. and his L.R.C.S., he left Edinburgh in 1867 to accept the position of house surgeon to Wakefield Hospital. It was here that he did his first ovariotomy, July 29,1868, in the earlier months of his twenty-fourth year. He did five other ovariotomies between that and 1870, when he removed to Birmingham. Although he had done six ovariotomies by the time he was 25, the fact does not seem to have turned his head in the direction of special work, for when he came to Birmingham he located in one of the suburbs and devoted himself to general practice. The year of his advent into the great midland metropolis was spent largely in preparing for and passing his English examinations. This year he took his M.R.C.S. Eng. and his F.R.C.S. Eng., and completed his Fellowship in the Royal College of Surgeons at Edinburgh.

At this time the young Scotch surgeon was very poor. It required but little persuasion to induce him to associate himself in office with Dr. Bell Fletcher, an established practitioner. He took this important step in 1871, and in doing so announced

himself as a consulting surgeon. This, in a young man of 26, required much courage, particularly in conservative England. Courage, however, was a quality in which Tait was never wanting. His self-assertion commanded recognition. The community began to estimate him as he estimated himself. He joined in a movement to establish a hospital for women—a movement which, in spite of the strong opposition of the conservative element, was crowned with success, and Mr. Tait was elected to the honorary staff, a position which he retained during the succeeding twenty-two years; after which he was made consulting surgeon, a distinction which he held at the time of his death. His identification with this movement was the real commencement of a career as illustrious as any in the annals of surgery. The succeeding year (1872) he performed two operations of historical importance. On February 2 he removed an ovary for suppurative disease, and on August 1 he extirpated the uterine appendages to arrest the growth of a bleeding myoma. This simple statement sounds commonplace enough to-day, when the first of the procedures is exemplified daily in almost every operating room in the world, and when the other, after a considerable vogue, has been supplanted largely by other and more satisfactory methods. It should be remembered, however, that in that day neither operation had been done, and that their performance was looked on by the time-servers as the unwarranted exploit of surgical audacity. Criticism began to flow in from every side. The chorus of fault-finding was augmented by those who sought to stifle his evolutional teaching at the Midland Institute, at which he was lecturing on physiology and biology. But he never failed to give a Roland for an Oliver—often, be it said, when the Oliver was not worth it. To Mr. Tait, however, criticism was but a wholesome stimulus, and antagonism but an incentive to further endeavor. Fired by a realizing sense of the importance of his new achievements, and spurred on by the animadversions of his adversaries, he wrote his famous and epoch-making thesis on '' Diseases of the Ovaries,'' for which the British Medical Association voted him the Hastings Gold Medal for 1873. It was during this year that he did his first hysterectomy for myoma of the uterus, following, with but slight modification, the technique of Koeberlé. The next year—1874—he was instrumental in organizing the Birmingham Medical Institute, of which he became an original member. His activities of this sort, however, were not limited to the medical profession. He was interested in everything about him, but especially in art, the drama, and politics. Despite his now rapidly developing work, despite the controversies to which it gave rise, and despite the antagonisms arising from his Darwinism, which he continued to expound at the Institute, he sought further antagonisms by entering the political arena, although in a minor way. He was elected to the Town Council in 1876. While he was busy with all of these interests he was engaged also on work of a more enduring character. One was his now classic little work on '' Hos-

pital Mortality," which appeared early the next year. It was really his final and crushing manifesto in the long argument he had been conducting with the conservatives. No work of equal size ever produced a more profound impression on the profession of England. It was followed the same year by his little book on "Diseases of Women." This small volume came to your speaker when he was practising his profession in an isolated village in a Western State. He had been taught to apply caustics, to replace the uterus, to adjust pessaries, and to do divers and sundry other things which in the aggregate made up the gynecology of that period. He had faithfully followed the teachings of the day—and had become convinced of their futility. The first ray of light came to him in the little book from Birmingham—and the darkness began to dissipate. Never was a book studied with more zeal—a zeal which a few years later led him across the Atlantic to Birmingham to see somewhat of the new surgery at the hand of him who had fashioned it. But it is to him rather than to myself that I must devote my discourse. Never was a surgeon or a citizen in his early thirties busier than was Mr. Tait at this particular period. The year that he published his "Hospital Mortality" and his "Diseases of Women" witnessed his adoption of the practice of removing the uterine appendages for incurable diseases of the Fallopian tubes. He removed a hematosalpinx June 21 and made the profession familiar with its pathology. It was also about this time that the storm of antagonism against his Darwinism broke out with renewed vigor, and ecclesiasticism exhausted itself in vituperation.

The next year—1878—witnessed his completion of a series of 50 ovariotomies with 19 deaths. This left him 13 per cent for which to apologize, as the accepted inevitable mortality, as exemplified in the work of Sir Spencer Wells, was 25 per cent. But he was reasonably safe from criticism, for he had operated under the carbolic spray and in accordance with the canons of the then new Listerian gospel of surgery. Mr. Tait himself, however, was far from satisfied with either his results or the conditions under which he had secured them. He then and there expressed his doubts as to the efficiency of those procedures which in the aggregate were called "Listerism," but he at the same time seized on the central truth of the new surgery and proclaimed his belief in "scrupulous attention to cleanliness of every kind and in all directions." This was distinctly the beginning of "aseptic" as distinguished from "antiseptic" surgery; and I believe this audience will bear me out in the declaration that while each has its place, the former rather than the latter is to-day the accepted method of procedure. At any rate, Mr. Tait, as was his wont, shaped his practice according to his convictions. He modified his technique in the direction of simplicity. One accessory after another was laid aside until a knife, scissors, needles and thread, a few hemostatic forceps, some sponges, and tap water were the essential constituents of his armamentarium. I shall never forget the contempt with

which he alluded to the great parade of instruments in the operating room of a distinguished Parisian surgeon, stating that it suggested an intention "to fight over again the battle of Waterloo."

It was with this simplified technique that he proceeded with his great work. It was during this year that he first opened the abdomen for the treatment of pelvic abscess. The next year—1879—fairly bristled with new achievements. He did his first cholecystotomy, and his explanation and defence of the operation marked the beginning of the rational surgery of the gall tract. This same year he removed the first pyosalpinx and the first hydrosalpinx in his practice, and again called attention to pathologic conditions that had been described a half-century before by more than one writer. So strong had become the opposition to him by this time that it was quite fashionable, especially in London, to openly discredit everything that he said or did. A most distinguished metropolitan operator at this time openly expressed his doubts, not only as to the fact of Mr. Tait's newly-heralded operation, but also as to the very existence of the disease for which it was alleged to have been done. Mr. Tait, however, answered the criticism by exhibiting his specimens—and went on with his work. Within this busy twelvemonth he described his flap-splitting operation for repair of the perineum, introduced his method for the reposition of the inverted uterus, developed his plan for the dilatation of the cervix by continuous elastic pressure; and not satisfied with this, he organized the Birmingham Natural History Society, publishing a valuable paper on the minute structure of the pitcher plants! He was also interesting himself in archeology, and published at different times articles on "Orientation of Churches," "Prehistoric Fortifications," "Monumental Brasses," and "Britain during the Stone Age."

The next decade opened on this resourceful man in the very maximum of vigor. His first work in the eighties was to introduce and establish the operation of hepatotomy, his cases rapidly multiplying until he was able to publish a series of 10, 9 for hydatids and 1 for abscess. This report opened the eyes of the surgical world, but not more so than did another that he published during this year. This was his second series of 50 ovariotomies with only 3 deaths, as against 19 in his previous 50. A drop in his own mortality from 38 to 6 per cent, a point 19 per cent lower than that of Sir Spencer Wells, was an evidence of achievement that required no wordy proclamation. What was more, these results had been obtained by Taitonian rather than Listerian methods—by "aseptic" rather than "antiseptic" formula. This was the first strong manifesto of Mr. Tait against Listerism, and was the real beginning of an antagonism that he waged until his death.

The next two years—1881 and 1882—were not so fruitful in intellectual results as the dozen which had preceded. It was in 1881 that Mr. Tait permitted an opportunity to pass unimproved whereby a patient lost her life and science was for a

time deprived of a helpful impetus. He was called by Mr. Hall-Wright and urged to operate for a case of ruptured tubal pregnancy. He hesitated and the patient died. The autopsy showed the feasibility of the operation. I shall ever remember the description of his chagrin as Mr. Tait told me of this incident several years later. It was not until January 17, 1883, that he encountered his next case of this character. It may be safely surmised that there was no hesitancy this time. He operated and saved his patient. A series of 35 cases of operation for ruptured tubal pregnancy with but 2 deaths speedily followed, and its publication put this surgical resource on a sound footing. While all this and other work was in progress, this indefatigable man found time to expand his Hastings Prize Essay into a treatise on " Diseases of the Ovaries " and to see it through the press.

In 1884 Mr. Tait, prompted by a catholicity of spirit which protested against what he termed the exclusiveness of an existing London organization of which he was a member, joined a number of his friends in the organization of the British Gynecological Society, of which he was elected vice-president. During this same year he published his first recorded 1,000 cases of abdominal section. This was followed the next year by the publication of his startling record of 139 consecutive ovariotomies without a death. This remarkable record was also offered as a protest against Listerism. It was assailed, as a matter of course, and the question became one of veracity. But the cases were of record, and when I visited him a few months later I had the satisfaction of examining the bedside notes, all duly signed by those present at the operation and by the nurses who kept them. With all the protesting, not an allegation in that record stands disproved. It was in 1884 also that Mr. Tait visited America at the invitation of one of our Fellows, Dr. Vander Veer, and demonstrated his operations in the hospitals of New York, Albany, and other cities.

One would suppose that so much of professional work would exhaust all of at least one man's energy, but such was not the case with this remarkable man. About this time he withdrew from the Town Council and contested, unsuccessfully, the Bordesley division as a radical home-rule candidate for Parliament. He was also a writer of leaders for the principal newspaper of his party in Birmingham, in which enterprise he also had a pecuniary interest. He was also a shareholder in a theatre and gave some personal attention to its conduct. In 1886 he was the president of the British Gynecological Society and went regularly to London to preside over its monthly meetings. With all of this activity he seemed to crave still further responsibilities. In 1888 he delivered the Ingleby lecture, choosing " Ectopic Pregnancy " as his topic. The same year he. accepted the professorship in gynecology in Queens College. One of the earliest fruits of his professorial labors was the collection of his previous writings and their publication the following year in the first volume of a projected two-

volume work on " Diseases of Women and Abdominal Sur-
gery "—the second volume of which never appeared. This
same year (1889) he was elected president of the Birmingham
Medical Institute, an office which he held during the next four
years. But it is impossible, in the brief space of an address such
as this, to trace, step by step, the great work accomplished by
this man. To the brief résumé which I have already given I
must add that he was elected to the presidency of Mason Col-
lege, and that he was awarded the Cullen and Liston Memo-
rial Prize by the Edinburgh College of Physicians for his ser-
vices to medical science. From America, also, he received
honorable recognition. The University of the State of New
York conferred on him, *honoris causa*, the title of Doctor of
Medicine, as did the St. Louis College of Physicians and Sur-
geons, and he was an Honorary Fellow of both the American
Gynecological Society and of the American Association of
Obstetricians and Gynecologists.

The last five years of Mr. Tait's life were marked with
a more or less continuous invalidism. He was operated on
in London for stone, and subsequently developed a chronic
nephritis. These and other depressing influences prompted
him largely to relinquish his operative work, and he sought
repose at beautiful Llandudno, facing the Conway estuary and
commanding a view of the Penmaenmawr Mountains. So
impressed was he with the sanative features of this location
that, but a short time before his death, he purchased an inn on
a high point of land with the object of converting it into a
sanatorium for consumptives. But he was never permitted to
carry this philanthropic plan to fruition, as he was suddenly
seized, June 3, with renal complications, from which he suc-
cumbed June 13, 1899. In accordance with his request his
remains were cremated at Liverpool. In further compliance
with his wishes his ashes were deposited in a cave on his private
grounds.

It is difficult to summarize a life of such originality and
activity. It may be said of Mr. Tait, however, that he laid
the foundation of modern abdominal and pelvic surgery; that
he personally devised the chief operations that pertain to that
department of practice; that he invented many new instru-
ments and improved many others; that he refined surgi-
cal technique to its present simplicity; that he demonstrated
for the first time much of the now accepted pathology of the
uterine appendages; that he reduced the mortality in abdom-
inal and pelvic surgery to the minimum; that he, more than
any other one man, forced the reforms whereby modern hospi-
tals have been brought to their present high state of efficiency;
and, finally, that he has added many years of life and happi-
ness not only to women but to mankind. Living *primus
inter pares*, his death leaves the largest possible vacancy in
the productive intellectuality of the surgical world. But the
influences he set in motion are happily immutable, and illus-
trate, in the words of Longfellow, that

> " when a great man dies,
> For years beyond our ken,
> The light he leaves behind him lies
> Upon the paths of men."

This was followed by the delivery of the President's address by DR. EDWARD J. ILL, of Newark, N. J., who selected for his subject

THE RIGHTS OF THE UNBORN—THE PREVENTION OF CONCEPTION.[1]

Second Day—Afternoon Session.

DR. RUFUS B. HALL, of Cincinnati, Ohio, read a paper on

RETROPERITONEAL TUMORS, WITH REPORT OF A CASE AND PRESENTATION OF SPECIMEN.[2]

DR. JAMES F. W. ROSS, of Toronto, read a paper on

RUPTURE OF THE PUERPERAL UTERUS, WITH CASES.[3]

In the discussion DR. JOHN M. DUFF, of Pittsburg, narrated the following case of accidental vaginal hysterectomy during delivery : The case in question was a woman about to be delivered for the third time. She went to the home of her father so that she could be attended by the family physician. The family physician was called in the evening about 10 o'clock and found on examination a breech presentation. The pains were very violent but ineffective, and, inasmuch as she was suffering greatly, he concluded to give an anesthetic, and in order to do so sent for a neighboring physician of some forty years' experience and of good reputation. Number two came in. Number one gave the anesthetic, and number two proceeded to deliver the child. He delivered the body of the child, but in doing so in some way decapitated the head and allowed it to remain in the uterus. He then applied a forceps to the head and attempted its delivery. Failing in this doctors numbers three and four were sent for. Number three called and performed a craniotomy and delivered the head. I do not know what number four did. Number three said that he had also delivered the placenta. The physicians left the house about 5 o'clock in the morning, with the woman being in apparently good condition. A few hours later the attending physician returned, and on examination found that there was something protruding from the vagina. This proved to be the intestines. He immediately telephoned for me, but I could not go at once. I went three hours later to his office and found him in bed sleeping. He came down, and I asked him what was wrong. He said he did not know unless it was a rupture of the uterus. He related the history as I have just given it. On arriving at the house and entering the room, I found the patient in bed in as good condition as could be expected, and she declared herself

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[1] See p. 577, November JOURNAL.   [2] See p. 649, November JOURNAL.
[3] See original article, p. 820.

to be feeling fairly well. She had a good pulse and temperature and was not apparently suffering from shock. I made an examination and found considerable bowel protruding through the va gina and torn off from its mesenteric attachment. The surroundings were very bad, and I suggested that the woman be taken to a hospital at once without any further examination. I pushed the bowel up and packed gauze into the vagina, had her taken to the West Penn Hospital in Pittsburg, where I had invited in the meantime several members of this Association to be present at the time I was ready to operate. She was taken to the hospital about 3 o'clock in the afternoon. On examination per vaginam I could not find the os uteri. With a little further examination I could not determine where the uterus was. My hand would go up into the abdominal cavity and I could not feel it. I then opened the abdomen and took out several feet of bowel that was gangrenous and put in a Murphy button. I then proceeded to search for the uterus, but it was gone, it having been amputated at the vaginal attachment as nicely as if it had been cut off with a knife. I then washed out the abdomen thoroughly, the fluid passing through the vagina as well as through the opening in the abdominal wall. I then told the nurse to count the sponges. There was one sponge missing for a little while and I began to search around in the abdominal cavity for it, and I felt something under the spleen and I thought it had slipped up there, and in reaching I pulled out the placenta from under the spleen. I sewed up the abdomen, and she was put in as good condition as possible. She rallied from the anesthetic, and, strange to say, regained consciousness and talked in a rational manner with the nurse and attendants, and lived until the next morning, when she expired. I simply report this case on account of its being unique, and the Fellows will excuse me for not mentioning names, as under the circumstances it would not be the proper thing to do.

Dr. W. Japp Sinclair, of Manchester, England, said he had not seen very many cases of rupture of the uterus, and his experience is that treatment is not very successful. He has encountered a few cases of rupture of the uterus in the hands of other practitioners, and, without exception, they have been the result of sheer ignorance and want of judgment.

Dr. Willis G. Macdonald, of Albany, narrated a case in which the child and placenta were delivered and a number of feet of intestine presented to the outside world, which was cut off by an ignorant practitioner. He was called to see the case and did an anastomosis with the Murphy button, but there was such a mixture of feces and blood in the abdominal cavity that the woman died.

Dr. Ross, in closing, said that when the child is extruded into the abdomen it is unwise to interfere from below, but much better to have the patient removed to a hospital, prepare her for a celiotomy, and do everything from above.

Dr. W. E. B. Davis, of Birmingham, Ala., read a paper on

WOUNDS OF THE LIVER AND BILIARY TRACT.

Penetrating wounds of the liver are not common. The surgeon may inflict such injuries in the treatment of hydatid cysts and abscesses of the liver. Severe wounds usually prove fatal. There is often injury to the biliary canals of the liver, and the extravasation of bile contributes to the fatal issue. The following three cases illustrate injuries produced by the surgeon:

In a man aged 60 years, in which there was only a half-ounce of pus found in the right lobe of the liver, in searching for this small cavity a wound of very considerable depth and great size, perhaps two inches in length, was inflicted. There was very profuse hemorrhage, which was controlled by iodoform gauze packing. Great quantities of bile were discharged for three weeks. Patient made an excellent recovery, attributed not only to the drainage of pus, but to the opening up of some of the biliary canals, which resulted in the emptying of the liver.

In a woman 30 years of age, in whom there were attacks of pain, fever, and jaundice from a movable stone in the common duct, the liver became very much enlarged, and during an attack of peritonitis an incision was made and the right lobe of the liver freely opened and packed with gauze. There was no pus in this case. Patient rapidly recovered. The liver returned to its proper size and the stone was passed some months after when the patient was being prepared for a radical operation.

In a woman 60 years of age the symptoms indicated obstruction of the common duct. The liver extended almost to the umbilicus. No nodules were to be made out on the surface. There being no obstruction in the common duct, it was decided that the obstruction was in the hepatic duct or its branches. A free incision was made into the right lobe of the liver, with the hope of opening some of the biliary canals and thus relieving cholemia. Death occurred a few days after from exhaustion. The patient was almost in a dying condition at the time of the operation. A large malignant nodule was found at the autopsy in the transverse fissure, which completely obstructed the branches of the hepatic duct. Wounds of the biliary tract beyond the liver produce death, not so much from the sudden escape of bile as from the continuous pouring of fresh bile into the peritoneal cavity. Gallons of fluid would not cause death if there were protective adhesions. A case of gunshot wound illustrated this point, where the patient was cured by repeated tappings, large quantities of bile being removed at the first operation. He also reported experiments on animals where the adhesions had given way after two weeks and death resulted from peritonitis. Rupture of the liver might be limited to the upper or lower surfaces, or the organ might be completely torn through, the parts being held together by the veins. In 4 cases in which he had operated on dogs and removed more than one-third of the liver, all died. In 1 case in which he removed the extreme left lobe of the liver the animal made

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complete recovery. He reported 6 cases of operations on animals illustrating the fact that small quantities of bile could be injected into the peritoneal cavity without harm. In 1 case he injected as much as five drachms of bile. He reported 23 cases where he had operated on dogs to demonstrate the effect of bile on the peritoneal cavity. In those cases where there was only small escape of bile the animals recovered. Where there was considerable extravasation the animals died in from one to three days. The omentum and abdominal viscera in these cases would be highly bile-stained, but there was not the redness of intestines that is observed in septic peritonitis. He claimed that the treatment of these cases consists in promptly opening the abdomen, controlling the bleeding by gauze packing, and drainage. He reported a large number of cases in which he had produced wounds of the gall bladder and ducts of dogs which had been successfully dealt with in this way. The opening in the bladder or duct would close as quickly as the fistula of a cholecystotomy.

DR. WILLIAM H. MYERS, of Fort Wayne, Ind., followed with a contribution on

THE PAST AND PRESENT SURGERY OF THE GALL BLADDER AND BILE DUCTS.

DR. ROBERT T. MORRIS, of New York, spoke with reference to bile entering the peritoneal cavity, saying a small amount is comparatively harmless unless it is accompanied by inflammatory products from the lumen of the gall bladder. If we have a mixed infection, a colon bacillus infection, which is common in cases of gall stones with empyema of the gall bladder, the infection follows the course of the leaking bile more rapidly, the bile serving as a vehicle for carrying infection. However, even in such cases, with a small (capillary) drain surrounded by gutta percha, he has lost fear of drainage of bile into the peritoneal cavity from the common or cystic duct, or from the gall bladder, which cannot be sutured or drained properly.

DR. JOSEPH EASTMAN, of Indianapolis, expressed his interest in the subject of gall stones, and complimented Dr. Myers on his scholarly paper, as well as Dr. Davis upon his very interesting and practical experiments on injuries of the liver and biliary tract. He reported two cases which put his methods of diagnosis to a severe test. He had never seen a case where a gall stone has obstructed the common duct if the liver was enlarged one-third, or three times as large as it should be. He thinks a patient cannot live very long with a stone in the common duct, absolutely deprived of all secretory and excretory functions of the liver.

DR. FRANK C. FERGUSON, of Indianapolis (by invitation), showed a specimen with gall stones *in situ* in the gall bladder. From their size it was evident the stones had taken months and even years to form in the gall bladder.

DR. WILLIS G. MACDONALD, of Albany, is of the opinion that gall stones do lodge in the common duct. Such cases have been reported, and he himself has operated upon a case. He also said that McBurney, of New York, has reported two or three such cases.

DR. J. HENRY CARSTENS, of Detroit, emphasized the importance of teachers and writers of books on the practice of medicine of not paying so much attention to the symptom of jaundice. He believes that the general practitioner thinks it is necessary for a patient to have jaundice in order to have gall stones. This is a mistake.

DR. M. ROSENWASSER spoke with reference to rectal injections of olive oil in cases of gall stones, saying it is highly necessary to discriminate when a cure is reported by this or any other method. He mentioned cases that were said to be successfully treated by these injections, but which subsequently required operative intervention for the removal of the stones from the gall bladder.

The discussion was closed by the essayists.

Third Day—Morning Session.

DR. JOHN M. DUFF, of Pittsburg, Pa., read a paper entitled

HEMORRHAGE AND THE MENOPAUSE.[1]

DR. D. TOD GILLIAM, of Columbus, said he was very glad indeed Dr. Duff had written this paper, as he believes it will do a great deal of good, providing it is distributed among the general profession. The general practitioner is not alive to the importance of the subject, and surely the laity themselves are very much at fault. It is a common thing for a woman to regard a case of extraordinary bleeding from the genitals with perfect complacency, she regarding it as the harbinger of a change which a great many look forward to eagerly, but in 95 per cent of the cases these hemorrhages are indicative of pathological changes.

DR. T. J. CROFFORD, of Memphis, agreed with the essayist and the previous speaker that the hemorrhages are due to pathological conditions in a large proportion of cases. He covered the same ground in a paper which he read before the Texas State Medical Association. The general practitioner is more responsible than the gynecologist, because, as a rule, he sees the case first. The general practitioner should be well informed on these points.

DR. WALTER B. DORSETT, of St. Louis, said we should go one step further in regard to enlightening the general profession, and that is to take up the subject more in detail and make it more impressive upon students. Professors in the different medical colleges ought to dwell more particularly on the subject of symptoms in regard to cancer at or about the menopause. It is not unusual for the gynecologist to have cases

brought to him from remote districts, and he is obliged to tell these patients that they have to go home without an operation; that very little, if anything, could be done for them. He thought that possibly the late Mr. Tait was more or less to blame as regards the education of the general profession with reference to the symptomatology of cancer.

He has seen a number of cases in which hemorrhage was the principal symptom of which the patient complained, and that pain, except in very advanced cases, is almost always absent. This is particularly true in disease of the cervix rather than the body of the uterus. He believes that pain in the body of the uterus is a very much more frequent symptom than that of pain in cancer of the cervix.

DR. WILLIS G. MACDONALD said that the men who tell patients that an extraordinary flowing is due simply to change of life, and that it disappears after a year or two, are the ones who treat acute and fulminating appendicitis with opium. Medical students should be taught the pathological importance of these hemorrhages.

DR. DUFF, in closing, said the Fellows of the Association owe it to themselves and to humanity to try and make an impress upon the general practitioner. He does not wish to be understood as attacking the general practitioners, because many of them are the noblest men in the profession; but it is a lamentable fact that a great many physicians are wrong on this subject. He hopes the paper will bring about the results for which he is conscientiously working.

DR. M. ROSENWASSER, of Cleveland, O., read a paper entitled

REPORT OF FOUR ADDITIONAL CASES OF UTERINE FIBROIDS COMPLICATING PREGNANCY.[1]

DR. JOHN M. DUFF narrated the case of a woman who had a pedunculated fibroid low down in the pelvis, with the uterus above. She was five months pregnant when he saw her. She was also seen by Drs. Sutton and King, both of whom advised operation. He (Dr. Duff) had also advised it, because he could not see how the child could be delivered without a Cesarean section or Porro at the end of term, and that if the tumor were removed at this time it would give her a better chance. She declined operation, and, to his astonishment, one night Dr. King was called to see her when she was in labor and doing nicely. The fibroid was away up in the abdominal cavity and she was delivered without any trouble.

DR. T. J. CROFFORD, of Memphis, reported two very instructive cases of fibroid tumors complicating pregnancy, and said it required the very best judgment at times to know when to and when not to operate.

DR. D. TOD GILLIAM said there were indications for operative interference in a very large proportion of cases of fibroid

[1] See p. 608, November JOURNAL.

tumors complicating pregnancy. When the mortality from non-interference is fifty per cent, it is reasonable to assume that it can be improved by operative intervention. By early radical operative interference a great many cases can be saved. but the life of the child must be considered. In a number of instances the child has not lived to full term and is thrown off. He believes that frequently we may do operative work during the period of gestation without very greatly endangering the viability of the child, as a myomectomy, and leave the uterus in a condition so that gestation may go on.

DR. H. W. LONGYEAR, of Detroit, thinks that statistics of fifty per cent mortality do not prove very much, for the reason that many cases of fibroid tumors complicating pregnancy were never heard from. The general practitioner does not report those cases if they turn out all right. To simmer the matter down, it is largely a question of individual judgment in each case.

DR. ROSENWASSER, in closing, said that he had operated on the two cases he had reported after giving the women a fair statement of their condition and of the prospects of both of them. Both preferred to have an operation done at once. If he had not done it somebody else would. He asked the question, "Am I right in my position in operating on these cases?"

DR. EDWARD J. ILL, of Newark, N. J., said, with reference to the question of Dr. Rosenwasser, that the same thing was brought up in one of the New York societies, and one man hit the point when he said, "I must do it. If I don't, my neighbor, Dr. So-and-so, will." and Dr. Ill thinks that there is where the fault comes in. Physicians have not got the courage to say to these women, "There is no reason why you should have this tumor interfered with now."

DR. T. J. CROFFORD, in speaking to the same question, said it takes a good deal of courage to face the religious sentiment, and he believes the physician needs just as much courage on that side as on the other. So far as operating on the case for fear his neighbor might do it, he looked upon this as simply childish. An operation should be indicated before it is performed.

The following officers were elected for the ensuing year: *President*—Dr. Rufus B. Hall, Cincinnati. *Vice-Presidents* —Drs. L. H. Dunning, Indianapolis, and T. J. Crofford, Memphis. *Secretary*—Dr. William Warren Potter, Buffalo. *Treasurer*—Dr. X. O. Werder, Pittsburg.

The next meeting will be held at Louisville, September 18, 19, and 20, 1900.

REVIEWS.

TREATISE ON ORTHOPEDIC SURGERY. By EDWARD H.
BRADFORD, M.D., Surgeon to the Children's Hospital and
to the Samaritan Hospital; Assistant Professor of Ortho-
pedic Surgery, Harvard Medical School; and ROBERT W.
LOVETT, M.D., Assistant Surgeon to the Children's Hospital;
Surgeon to the Infants' Hospital. Illustrated with 621
engravings. Second revised edition. New York: William
Wood & Company, 1899.

The publication of a second edition of a treatise on ortho-
pedic surgery by Bradford and Lovett is proof positive of the
appreciation by the profession of the work of these two emi-
nent surgeons and also of the interest taken in this special
branch.

The present volume is a marked improvement on the first,
which was produced nine years ago. At that time medical
men were beginning to take a general interest not only in the
mechanical but in the operative treatment of deformities.
The formation of the American Orthopedic Association and of
a similar society in Great Britain, the establishment of an
orthopedic section in the International Medical Congress at
Berlin, and the appointment of professorships in orthopedic
surgery in many of the American medical schools were impor-
tant events, occurring about this time, which served to call
attention to a branch of surgery little known, but which is as
firmly established to-day as a distinct specialty as is gynecol-
ogy. The general surgeon may claim that both these special-
ties are unnecessary; that they are only a part of surgery; that
the orthopedic surgeon should not operate, that he should only
apply braces, but the general practitioner and the laity believe
that the man who sees the most cases of any disease is the best
fitted to decide whether mechanical or operative measures are
indicated, and from his familiarity with both is also best fitted
to carry out the particular line of treatment decided upon.

During the past ten years many important books have been
written on orthopedic surgery, the best known being those of
Hoffa, of Würzburg; Schreiber, of Augsburg; Redard, of Paris;
by English authors, Tubby, Clarke, Thomas and Jones; and
by Americans, new editions of Sayre and works by Young,
Moore, and McCurdy. In addition, many valuable articles
have appeared, much original work has been done, and all
recent books on surgery have devoted special chapters to ortho-
pedic subjects. We thus see that any one desiring information
in this particular branch has many books to choose from, but
we believe that a careful perusal of this new edition of Brad-
ford and Lovett will show it to be the best suited of any of the

others for the undergraduate or the busy practitioner. It is not a quiz compend, nor is it an encyclopedia, but a carefully written treatise.

The first edition contained 783 pages, and the second has but 655. Most of the chapters have been entirely rewritten, and, despite the fact that there are 130 pages less, much more infor- mation is contained in the new volume. This has been made possible by condensation of many articles and by a very full reference in foot-notes to authorities quoted, so that any one desiring further information on any subject has a very fair bibliography. Many object to this, but we must remember that the busy practitioner wants full and complete information, the student needs certain facts brought out clearly, so as to impress them on his memory, while the writer on any subject will want not only the personal views of the authors, but the views of others, and this the bibliography enables him to supply.

In addition to condensation there are but 22 chapters in the new as compared with 25 in the old edition, chapter xxiii. on Dupuytren's contraction of the fingers being entirely omitted, while the chapter on congenital deformities of the fingers and toes is cut down and made a part of that on clubfoot; and instead of a chapter on the pathology and another on the etiol- ogy and course of chronic joint disease, it is all treated in one. A very brief comparison of the first and second editions will show in the latter new and complete articles on coxa vara, which was not even mentioned in the first edition; on tendon transplantation in the treatment of deformities of the hand and foot due to paralysis, which had a reference of a few lines only before; and full and complete descriptions of the work of Hoffa, Lorenz, and Pacci on congenital dislocation of the hip, and on Calot's treatment for Pott's disease. The pathology of tuberculosis of joints contains the original work of Dr. Nichols, including the illustrations, and renders this portion of the book most valuable and thoroughly up to date.

In addition to freely giving their own experience, the authors have made profitable use of the vast amount of literature that has appeared since their first edition was written, and in every chapter some mention is made of the work of others and credit given where it belongs—a matter too often overlooked by med- ical writers.

The views given as to treatment are those generally accepted to-day, and are those of men who fully believe in the mechani- cal treatment, but are alive to the fact that many cases need surgical interference, and a careful study of the different chap- ters will enable the practitioner to decide what apparatus or operation is indicated in a given case. Their views as to the Calot treatment of forcible reduction of the deformity of Pott's disease are sound and conservative, and they justly do not recommend its indiscriminate use.

In congenital dislocation of the hip they do not advocate

operative interference, although fully describing the various operations, but their statement "that forcible reduction, presented by Pacci and greatly improved by Lorenz, has been employed with undoubted and permanent success, and with much less risk than that following reduction by incision," leads us to infer that is the method they recommend, although it might have been stated more clearly, as the subject is one of great importance both to the patient and the surgeon. The method of forcible reduction is very poorly described, and the reader, if ignorant of the subject, must consult other authorities if he desires to carry it out; for, after speaking of the use of forcible extension of the limb, they say (page 444): "After this procedure has been carried on for several minutes, accompanied by forcible manual stretching, by massage of the adductor group, aided possibly by a tenotomy, the different maneuvres to stretch pericapsular ligaments of the hip should be executed." What are these movements or maneuvres? The usual summary of treatment at the close of many other chapters is unfortunately omitted here.

For the sake of those surgeons who may desire to do an osteotomy for knock-knee, it is to be sincerely hoped that none will try to copy the figure 518 on page 562. The osteotome is improperly held—the hand should grasp it near the limb in order to steady it, and an assistant should certainly hold the limb to prevent it slipping. The authors also use the terms chisel and osteotome indiscriminately; they are two different instruments, although used for the same purpose. Figure 246 on page 266 is also faulty, in that as shown the hip splint is not long enough and the limb is markedly adducted. Great care should be exercised in presenting such pictures, as the impression conveyed to the reader is a wrong one. Most men would believe that a splint applied as is the one in the figure is correctly applied or else it would not be pictured, but, unfortunately, such is not the case.

In the treatment of Pott's paraplegia the authors frankly state, "drugs are of little value." This may be true, but many in the profession firmly believe in the use of iodide of potash in such conditions, and its administration in connection with other measures, mechanical and surgical, can certainly do no harm, and Gibney has reported many cases in which he believed it of value.

The general arrangement of the book is excellent, but we believe chapters xxi. and xxii. should follow chapter xi., because while treating of clubfoot we ought to finish the deformities of the foot, etc., and chapter xiii. would then naturally follow, as it deals of paralytic clubfoot. The present arrangement is somewhat confusing, as, after reading of talipes equino-varus, we take up congenital dislocations, infantile paralysis, rickets, etc., and then return to the study of talipes equinus without the varus.

The printing, quality of paper, and illustrations, with a few exceptions, are unusually good, making a most attractive book,

and, as previously stated, the text is excellent, and we heartily recommend it to the busy practitioner or the student of medicine.   WISNER R. TOWNSEND.

THE TREATMENT OF PELVIC INFLAMMATIONS THROUGH THE VAGINA. By WILLIAM R. PRYOR, M.D.. Professor of Gynecology, New York Polyclinic; Consulting Surgeon to City Hospital; Visiting Surgeon to St. Elizabeth's Hospital, New York City. Pp. 224, with 110 Illustrations. Philadelphia: W. B. Saunders, 1899.

This little book is an exponent of the most radical surgical methods in modern gynecology. Its author is well known as a most ardently enthusiastic advocate of the vaginal route, and here makes a clear and unequivocal statement of his position. While his views may not be generally accepted in their entirety, there is much in them worthy of the thoughtful attention of every practitioner of medicine, and the results which he has obtained are certainly remarkable. The reviewer, who does not by any means accept Pryor's views unmodified, knows from personal observation that in a series of over one hundred and sixty operations for various suppurative conditions, many of them on patients in most desperate straits and refused operation by others, his mortality has been *nil*. This result he attributes in great measure to certain peculiarities of technique original with the author. His methods, which differ in some points from all others, are clearly and minutely described, from the initial preparation of the patient until she is ready to be discharged from care. Preceding the purely surgical part of the book, that treating of the vaginal operations, are chapters on the various forms of pelvic inflammation, which make more clear the author's reasons for his beliefs and give his methods of treatment in those cases where he does not think the more radical measures of vaginal "incision" or "ablation" necessary. The spirit that shines through every page is that of aggressive interference.

TWENTIETH CENTURY PRACTICE. An International Encyclopedia of Modern Medical Science. By leading authorities of Europe and America. Edited by THOMAS L. STEDMAN, M.D., New York City. In twenty volumes. Vol. XVIII. New York: William Wood & Company, 1899.

The contributors to this volume, which is entirely taken up by a most practical and satisfactory consideration of the two important subjects, syphilis and leprosy, are Jonathan Hutchinson, the world's greatest authority on inherited syphilis; Eduard Lang, professor of dermatology at the University of Vienna, who discusses the acquired form; and Prince A. Morrow, of New York, to whom is entrusted the section on leprosy, a subject of growing importance and interest to us since we have begun to reach out for new lands and have taken under our protecting ægis Hawaii, the Philippines, Cuba, and Porto Rico, in all of which leprosy is endemic and more or less prevalent.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECO-
LOGICAL ASSOCIATION. Volume XI. Published by the
Association, 1899.

This volume of over five hundred pages contains the thirty-
five original papers presented before the Society at its meeting
at Memphis, Tenn., during the month of December, 1898, to-
gether with the discussions which followed their reading. The
average value of the matter is high and shows that the Society
is steadily reaching upward toward the high ideal it has set for
itself.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Nursing by Albuminuric Women.—P. Budin and Cha-
vane[9] have observed five albuminuric women immediately
after delivery and four during the months following labor.
All of these nursed their children without any unfavorable re-
sults to the infants or themselves. The albuminuria frequently
disappears rapidly, and in any event does not delay convales-
cence.

Peptonuria in Pregnancy.—Mercier and Menu[8] conclude
from a study of this subject that it occurs in albuminuric cases
during pregnancy with or without eclampsia, being constant
in the latter; that it is not a sign of the death of the fetus,
or the cause of labor; that it is not pathognomonic of maternal
syphilis, as it is found in but one-half the cases in which
this is the indisputable cause of abortion; that the theory of
involution of the uterus is insufficient to explain the presence
of peptone in the urine, especially in cases in which pregnancy
runs a normal course. In view of the constant occurrence of
peptonuria during puerperal eclampsia, the writers regard it as
being due to disorganization of the liver or to suspension of
the function of that organ in connection with peptones.

Hereditary Supernumerary Digits.—Boissard[9] has ob-
served a patient in whom the second toe of each foot was
double and who possessed a supernumerary little finger on each
hand, these fingers having been amputated during childhood.
Her first child showed exactly the same malformations, and the
second, which was seen by Boissard, repeated the same series
of deformities with the exception that one foot was normal.
There was no history of hereditary syphilis in the family.

Transmission of Streptococcus from Mother to Fetus.—
Bonnaire[9] reports two such cases. In the first the mother was
suffering from erysipelas at the fifth month of pregnancy.
The membranes had been ruptured three days and putrid
liquor amnii was discharging. The fetus was expressed and
died forty-eight hours later. Cultures of its blood showed the
streptococcus only. In the second case the mother gave birth
to a dead child just before she succumbed to cerebro-spinal

meningitis. Autopsy showed pus over the cerebral and spinal meninges and exactly the same lesion in the fetus. Cultures from both showed streptococci; cultures of the blood were negative.

Amniotic Infection before Rupture of the Membranes.— Lehmann [9] reports a case of undoubted infection of the liquor amnii before rupture of the membranes. A thick and extremely fetid fluid escaped as soon as they were artificially punctured.

Labor during Paraplegia from Spinal Compression.— R. Mercier [9] reports a case of cancer of the breast in a pregnant woman 40 years old, with exacerbation during gestation and secondary cancer of the liver and spinal column. Paraplegia developed, but labor took place normally at term. The case is cited as confirming the conclusions of Pouth that involution and lactation are not interfered with by compression of the spinal cord.

Extra-amniotic Fetus.—C. Maygrier [9] describes a case of abortion at the fourth month in which the amnion had previously ruptured and the fetus had continued to develop in a cavity lined by the chorion.

Extra-membranous Pregnancy.—E. Glaize [7] divides such cases into those in which the amnion alone is ruptured and the fetus develops in the cavity lined by the chorion, and those in which both membranes are torn and the fetus lies free in the uterine cavity. The first class gives no symptoms, but in the second there is a continuous discharge of blood-tinged amniotic fluid, the fundus of the uterus is low, the fetus is palpated with difficulty, the breech presents in three-fourths of the cases, and ballottement is absent. There is no pain, as the discharge of liquor amnii meets no resistance. The prognosis is good where the amnion alone is ruptured, but when the fetus lies in direct contact with the uterine wall, as in the second class, abortion is liable to occur. Labor is slow in these cases; infection of both mother and fetus may occur. In extra-amniotic cases congenital amputations and malformations are found; in those completely extra-membranous the fetus shows only signs of compression. Every effort should be made to prolong pregnancy, as this has been known to continue one hundred and ten days after rupture of the membranes. The use of an incubator and other precautions may subsequently be necessary.

Twin Pregnancy and Malformations in Relation to Hereditary Tuberculosis.—G. Keim [8] calls attention to the frequent occurrence of hereditary tuberculosis as an etiological factor in twin pregnancy, and to the occurrence of tuberculosis and congenital malformations in the families of twins. He considers this an indirect proof that monstrosities and twins are allied. In support of his views he reports a double pregnancy of five months in a tubercular woman, the daughter of tubercular parents with stigmata of degeneration. Congenital amputation of a lower extremity of one fetus had begun.

Induced Labor for Contracted Pelvis.—Bar [8] reports 86 living children out of 101 in 100 cases of induced labor for con- tracted pelvis. The causes of death were slow labor, large fetus or small pelvis, and fragility of premature children. In pelves measuring 7 to 8 centimetres the infantile mortality was 53 per cent; in those between 8 and 9 centimetres, 21.95 per cent; in those of 9 to 10 centimetres, only 8.69 per cent.

Rupture of Uterus.—Bar [8] records a case of rupture of the uterus. The hand introduced passed through the rupture, and intestines were apparently felt. Laparatomy showed the rup- ture to extend only to the peritoneal coat, which was raised by the blood clot as high as the right kidney. Clots were re- moved through the vagina, and uterus and vagina tamponed. Recovery.

Acute Infection through the Umbilicus.—P. Le Gendre and H. Varnier [6] report a case of acute infection through the umbilicus. The cord had been covered with a dry bichloride dressing, and desiccation occurred. No baths had been given. On the thirteenth day the nurse removed the cord by slight traction. The temperature rose rapidly, and, as no other cause could be discovered, infection through the stump of the cord was supposed to have occurred, though no local signs of inflammation were present. An erythema appeared three days later on face, trunk, and extremities, and gradually disappeared on the fifth day, when the temperature became normal. No desquamation followed. The child was treated by baths at 98.6° F. every three hours; after each all symp- toms improved. Varnier states that in 26 cases in which he has dressed the cord with dry bichloride gauze it has fallen on an average of eight and one-half days, no baths being given. In discussing this paper *Doléris* advocates dressings of der- matol or bismuth subnitrate as favoring rapid desiccation and falling of the cord. *Porak* and *Pinard* express practically the same opinion. *Lepage* has used Unna's paste.

Typhoid Fever during the Puerperium.—In writing of the difficulty of diagnosing typhoid fever occurring after labor, when the rise of temperature is most naturally attributed to sepsis, Lepage [6] emphasizes the importance of examining the blood for Widal's reaction in all cases where the existence of sepsis is not practically certain. He also adds that the pres- ence of typhoid does not exclude the coexistence of septic in- fection. He reports 8 cases of postpartum typhoid fever, in 7 of which Widal's reaction was obtained. The eighth died after negative results had been obtained, but autopsy showed the cause of death to have been typhoid fever.

Influence of Operations on the Uterus and Appendages upon Subsequent Pregnancies and Labors.—At the termi- nation of a discussion of this subject by the Society of Obstet- rics, Gynecology, and Pediatrics of Paris, Pinard [6] offered the following conclusions, which were unanimously adopted by the society: 1. Operations upon the cervix under bad condi- tions may lead to subsequent functional disturbances of the

uterus during pregnancy, and even to severe accidents during labor. 2. Resection of the cervix by any method should be performed only for very severe indications and by very sure hands.

Influence of Pregnancy upon the Teeth.—Terrier [7] states that caries is more rapid in its advance, that the sensibility and friability of the teeth are increased, that their chemical composition is altered during pregnancy. These changes are caused by gingivitis of pregnancy, alteration of saliva, acid regurgitations from the stomach, general modifications in the digestive and in the urinary apparatus, and increased excitability of the nervous system due to pregnancy. He urges careful cleansing of the teeth and treatment of caries and gingivitis early in pregnancy, while the daily care of the teeth should be continued through pregnancy and lactation.

Mobility of Pelvic Articulations.—E. Bonnaire and V. Bué [3] state that the pelvic diameters, especially of the superior and inferior straits, are modified by the position of the trunk and extremities, and that such variations are favored by the relaxation of the symphysis which occurs to a varying extent in pregnancy. The sacrum can be tipped forward or backward on a transverse diameter through the junction of its upper and middle thirds. When the base of the sacrum moves forward the superior strait is narrowed, especially antero-posteriorly, and somewhat transversely; an opposite effect is produced by moving the sacrum in the reverse direction. Increase in size of the superior strait is accompanied by a corresponding diminution of the inferior strait. Hyperextension of the whole body while the sacrum rests upon a firm surface enlarges the superior strait antero-posteriorly by turning the base of the sacrum backward and lowering the pubis. The writers' personal observations have shown that the increase in size of the superior strait is less than Walcher has claimed. It averages, in their twelve cases, 2.5 millimetres. Extreme flexion of the lower extremities diminishes the diameter of the superior strait and increases that of the inferior strait to the extent of 16 to 18 millimetres, as shown by twelve personal observations. Hyperextension favors spontaneous engagement of the head in cases of rachitic variations in the pelvis. One can count upon a sufficient enlargement only in cases in which there is an appreciable mobility of the pubic bones upon each other. The position of hyperextension is indicated to aid the engagement of the head with the aid of forceps or to extract the aftercoming head which is delayed at the contracted superior strait. Part of the advantage thus gained is neutralized by the interference with obstetrical maneuvres caused by the position. The position of extreme flexion in which the knees are brought up to the shoulders is valuable in cases of contraction of the inferior strait, kyphotic pelvis; in those brow presentations in which the head is arrested in the pelvic cavity and must be extracted with forceps; and in those cases in which, after delivery of the head, the shoulders are so large as to be retained above the

floor of the pelvis. The maximum enlargement is obtained by bringing the knees opposite the shoulders, avoiding abduction and adduction of the thighs. This position is most efficient in kyphotic pelves in which no rachitic element is present.

Edema and Gangrene of the Vulva during Pregnancy.— V. Bué [1] reports two cases of this kind, varying in etiology. In one the patient was not albuminuric, had no edema of the lower extremities, and was about six months pregnant when edema of the vulva appeared. Scarification was done twice without interfering with pregnancy. Six weeks later gangrene of the vulva began and extended rapidly toward the abdomen, burrowing under each side of the mons veneris. The gangrenous tissue was removed. The woman then gave birth prematurely to twins. Some elevation of temperature followed, but recovery took place. The second case was an albuminuric primipara with edema of the lower extremities and eclamptic convulsions during labor. Although scarification was not resorted to, gangrene of the labium majus occurred. Labor took place at term, the infiltrated perineum was extensively torn, and death followed from sepsis. Bué considers the first case due to compression, as proved by the early appearance of edema, the coexistence of twin pregnancy, and the absence of albuminuria. The second is clearly of albuminuric origin. He advises scarification of the edematous parts only in case of absolute necessity, and great care of the resulting wounds.

Extrauterine Pregnancy.—Doktor [20] describes an interesting case of ectopic gestation which, on account of its abnormal conditions, led to many diagnostic errors. A woman, 26 years old, had always been well with the exception of a miscarriage in the third month, which occurred three years before entrance to the hospital. Since then menstruation normal. Last menstruation January 12, after which she noticed symptoms of conception. March 25, or when about three months pregnant, she began to flow and had cramps; she passed a mass which the attending physician diagnosed as the products of conception. Two weeks later did curettage for continuous bleeding. This, however, did not stop the flow, but four weeks later her condition was so much improved that she was able to be about. In the beginning of May, while taking a walk, she suddenly experienced severe abdominal pains, and a subsequent examination revealed a mass anterior to the uterus, for which massage was prescribed. On account of severe pain this treatment had to be discontinued. Three days later symptoms of severe collapse, followed by an increase in size of swelling and severe pains. She then entered a hospital (July 9), where she remained for ten days. An examination showed a large swelling, apparently anterior to the uterus, extending upward above the umbilicus and not especially sensitive. The cervix was apparently continuous with the swelling. October 26 she re-entered the hospital, stating that her abdomen continued to grow. It was found that the belly was occupied by a large, elastic tumor. With a syringe turbid fluid was withdrawn. Opening the

abdomen, the tumor was found to consist of an amniotic sac containing a macerated fetus of about six months. The opened sac was not removed, but sutured to the abdominal wound. It rapidly contracted, and the woman made a complete recovery. The physician who attended the patient when she was first taken ill stated positively that the expelled uterine contents consisted of placental tissue, and this case belongs, therefore, to the rare and interesting class of simultaneous intra- and extra-uterine pregnancy.

Leopold[21] publishes a series of cases of extrauterine pregnancy and states that, according to his researches, a primary abdominal gestation has never been proved, and that the ovum can only engraft itself upon a mucous membrane covered by a cylindrical epithelium.

Kreisch,[13] based upon exhaustive microscopical investigations, has found that at the point at which the ovum engrafts itself the tubal mucous membrane disappears. He observed the formation of a true decidua reflexa within the tube.

A. MacLaren[19] discusses a case of interstitial pregnancy which lasted nearly thirteen months. At the end of the tenth month labor pains came on, which lasted three days. Fetal heart sounds could be heard as late as the eleventh month. Near the end of the thirteenth month the patient commenced to show signs of exhaustion, and so she was operated upon. Upon cutting through the abdominal wall the operator came upon a thin-walled sac closely adherent to the abdominal wall. A gangrenous twelve-pound, perfectly developed male child was delivered. The placenta was hard and leathery, and so strongly adherent to the fetal sac that it was not removed. Normal saline injections were given and the wound packed with iodoform gauze, the wound being left open. Forty-eight hours after this operation the patient was again chloroformed, and the sac was unpacked and washed out and then repacked. This was done once a day for eight days, when the placenta came away. Good recovery.

Puerperal Statistics.—Peiser[22] reports a series of interesting statistics from Mermann's clinic. Mermann considers the genitals of the puerperal woman a *noli me tangere*, and douches are not administered before or after delivery. With the exception of infected cases, the interior of the uterus is never irrigated, not even after manual removal of the placenta or other operations. Subjective antisepsis is carried out in every detail, and both the hands of the operator and the external genitals are thoroughly disinfected before every examination. The statistics extend over 2,722 cases, with a total morbidity of 9.17 per cent. The mortality is 0.55 per cent. Not a single case of infection originated in the hospital.

Puerperal Tetanus.—Pitha[23] reports a series of cases from Pawlik's clinic forming an interesting contribution to the etiology, symptomatology, and therapy of puerperal tetanus. The first case was observed in November, 1897, and new cases appeared until September, 1898, when the disease was success-

fully stamped out. It is almost certain that the infection was carried to the clinic by the first case, and that after this the germs were conveyed to the other patients through infected instruments and hands. Tetanus bacilli were positively identified in every case, either in the uterine cavity or the perineal wounds. The tetanus infection continued and spread in spite of the most rigid antiseptic precautions, the bacilli resisting almost every possible method of disinfection. In spite of the most careful attention to the operator's hands, they may still be conveyed to the woman's genital tract through the microorganisms situated upon the external genitals. Besides the positive identification of the bacilli in the uterus and blood of the patient, cultures could also be obtained from the dust gathered in the room set aside for the admittance of patients. The period of incubation usually extends over eight days. It may, however, only last three or four days, and in exceptional cases more than ten days. The time for the appearance of convulsions is also uncertain. They occur all the way from two to fourteen days. It is only after these convulsions have begun that a positive diagnosis can be made. The first symptoms consist in difficulty of deglutition and spasms of the muscles of the pharynx. In 1 of the 10 cases described the disease manifested itself by a contortion of the facial muscles. In the further progress of the disease the muscles of the face, pharynx, neck, and back became involved and finally extended to those of the chest, diaphragm, and abdomen. The so-called hydrophobic form of tetanus is abnormally frequent in puerperal tetanus. All the 10 cases reported terminated fatally in spite of every therapeutic measure known to modern medicine. Even the extirpation of the infected tissues, both by the knife and actual cautery, was absolutely impotent to retard or arrest the progress of the disease. It should be distinctly emphasized that serum therapy, both subcutaneous and intracerebral, exerted no apparent beneficial influence, but the author urgently advises the administration of serum for the purpose of securing immunity of women not as yet infected.

The thorough and repeated sterilization of the instruments is the most potent prophylactic measure after the hospital has once been invaded by one or more cases of tetanus. It should also be noted that after immunizing injections to all the inmates of the hospital no new cases occurred; in other institutions where this precaution was not practised the disease continued in an endemic form.

Eclampsia.—Winkler [24] describes 9 cases of eclampsia in primiparæ. In all cases acute nephritis, diminution of urine, albuminuria, blood, and epithelial casts. In 1 case marked parenchymatous hemorrhage of the liver; in 2 others fatty degeneration, slight hemorrhages, necrosis, and obstruction of the capillaries with liver cells. Liver changes are secondary in character and due to traumatism during convulsion. Winkler concludes that attacks of eclampsia are uremic convulsions produced by an intoxication of the organism and depending on insufficient excretion by the damaged kidneys.

Prolapse of the Normally Implanted Placenta.—Haake[21] reports one of those exceedingly rare cases in which a normally implanted placenta was expelled before the birth of the child. The woman was a Vpara at full term. The attending midwife stated that the os had been fully dilated for about two hours, without the head making any advance into the pelvis. Abdominal palpation showed the uterus irregularly contracted, the fundus being hard and diminished in size. The head presented transversely and projected beyond the symphysis. The membranes were still unruptured. No escape of blood from the vulva. Soon after the arrival of Haake the membranes ruptured spontaneously, followed immediately by the expulsion of the placenta and membranes accompanied by considerable hemorrhage. The indications were to empty the uterus with the greatest possible speed. The head was perforated and the child delivered with some difficulty, after placing the patient in Walcher's position. After emptying the uterus the bleeding ceased and the patient made an uneventful recovery. The placenta could not be examined microscopically, but the previous history of the patient indicated the existence of a gonorrheal endometritis.

Vesicular Mole.—Solowij[11] describes the specimen of a uterus containing a vesicular mole which has penetrated the uterine walls, especially the posterior one, where the peritoneal covering is almost entirely destroyed. The growth has also invaded the parametrium and fragments are found in the ovarian veins. The pulmonary arteries and branches are the seat of metastasis, closely resembling the structure of vesicular moles. As at the present time we are not able to differentiate between benign and malignant vesicular moles, and the histories of cases of deciduoma malignum show preceding mole in fifty per cent, Solowij advises hysterectomy in all cases of deciduous moles where the uterine contents cannot be entirely removed.

Observation about Sore Nipples.—According to Platzer,[12] sore nipples are caused through biting and pulling during the process of nursing. The best treatment of fissures are applications of carbolic acid solution. Ulcerations should be washed with corrosive sublimate solution and dusted with dermatol. In mastitis nursing must be interrupted, the breasts compressed, and ice bags applied. Among 1,000 nursing puerperæ in Kezmarsky's clinic sore nipples were observed in 51.5 per cent.

The Bacteriology of the Puerperal Uterus.—Staehler and Winkler[13] publish a series of investigations from the Marburg University Clinic. The cavity of the puerperal uterus is normally free from bacteria. At times, however, saprophytes do occur, which, if the lochial flow is unobstructed, produce no symptoms. They may be the cause of slight localized inflammatory processes unaccompanied by a rise of temperature.

The Varieties of Streptococci Inhabiting the Female Genital Tract.—Menge and Krönig[13] publish the results of a careful investigation of the biology of the various forms of streptococci inhabiting the vagina and uterus and as to their

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pathogenic character and morphology. Their investigations prove that there are different varieties of streptococci, which, however, are not easily differentiated. The difference is apparent when placed in various culture media, and mainly consists in a sensitiveness to the presence or absence of oxygen. Menge and Krönig differentiate facultative and obligatory anaerobic streptococci. The latter, exceedingly sensitive to the presence of oxygen, can only be grown if atmospheric air is absolutely excluded. All obligatory anaerobic streptococci are not of the same type; some produce large quantities of ill-smelling gases. They occur as saprophytes in the normal vaginal secretion, but are also found as pathogenic micro-organisms in purulent peritonitis. As a rule, only one or the other variety is present. In a few cases of parametritis both varieties were found.

A Case of Puerperal Infection Successfully Treated with Antistreptococcic Serum.—Büttner[14] reports a case of puerperal infection appearing three days post partum. Temperature 103°, pulse 140. Examination showed a puerperal ulcer in the introitus. Fever and general symptoms continued in spite of persistent local treatment. After injecting fifteen cubic centimetres of Marmorek's serum the temperature became normal and convalescence was uninterrupted. Although the ulcer was not examined as to the presence of bacteria, Büttner concluded that it was a streptococcic infection. He advises the administration of antistreptococcic serum in all cases of puerperal infection, in spite of its many failures.

Treatment of Puerperal Infection.—A. W. W. Lea[15] draws the following conclusions from a series of 48 cases. A rise of temperature over 101.4° during the puerperium, not obviously accounted for by other causes, should lead to a thorough examination of the genital tract. If no explanation is found, a uterine douche should be at once given. If the temperature falls definitely within twenty-four hours, no further exploration is necessary. If, on the other hand, the temperature remains high and the pulse rate has increased, the cavity of the uterus should be explored with a sterile finger. When the initial temperature is great (103° or over) the uterus should be explored at once. When clots or placenta are discovered, they should be removed by the finger or curette, a douche given, and a gauze drain inserted for twenty-four hours. There is no evidence that curettage, if done with every precaution, favors the spread of infection. In a large proportion of cases the infection is rapidly checked. When there is a very virulent infection, early curetting affords the best chance of a successful result. If curettage entirely fails, it must be repeated or not, according to the local conditions present. The prognosis, however, is bad. In some cases, if curettage fails and there is no evidence of general peritonitis or of infection of the blood, vaginal hysterectomy, if performed in good time, may be successful. Antistreptococcic serum should be given early and freely in cases of proved strepto-

coccic infection. It is of little use in the advanced stages of the disease.

GYNECOLOGY AND ABDOMINAL SURGERY.

Congenital Tuberculosis.—Brindeau [8] reports what appears to be a case of congenital tuberculosis, although no examination of the mother was made. The child died on the twelfth day. The pulmonary lesions were so large and so far advanced that they were at first believed to be gummata, but microscopic examination showed them to be filled with tubercle bacilli.

Post-operative Epilepsy.—L. Marchand [5] reports the occurrence of epileptic attacks at the age of 22 in a woman who had undergone a double ovariotomy two months before the first convulsion. The attacks had recurred about four times a month up to the time of writing, when the patient was 43 years old. No etiological factor other than the operation was known.

Abdominal Castration for Inflammations of the Appendages.—H. Hartmann [10] announces his complete conversion to the abdominal route in castration for inflammatory lesions of the uterine appendages. He reports 40 cases with a mortality of 1 case, or 2.5 per cent. The remote results were most favorable in all but one case, a cachectic tubercular patient in whom a fecal fistula followed the operation.

Salpingo oöphoritis, Torsion of Pedicle.—A. Gosset and E. Raymond [10] report a case operated upon twenty hours after torsion of the pedicle. The sudden onset of intense abdominal pain, vomiting, slight abdominal distension, absolute constipation, and absence of discharge of gas by the anus strongly suggested intestinal obstruction. This was eliminated by the discovery of a tumor palpable above the symphysis and through Douglas' cul-de-sac.

Total Abdominal Hysterectomy.—S. P. Fedorow [1] reports four successful cases of total abdominal hysterectomy. The method which he has employed involves a median abdominal incision, opening the posterior and then the anterior cul-de-sac. The broad ligaments are then clamped close to the uterus by forceps introduced through the vagina, and the uterus and appendages removed. The opening in the pelvic floor is not closed, but is drained through the vagina, which is tamponed, and the abdominal wound closed. The clamps are removed in forty-eight hours, and the gauze drains in five or six days. The patients are out of bed in fifteen days, and the cicatrix is well formed in six weeks.

Total Abdomino-vaginal Hysterectomy.—A modification of this operation is described by d'Hotman de Villiers [2] in connection with a case of torsion of the pedicle of one of several large fibromata. He opens the anterior cul-de-sac through the abdominal incision, passes one end of a ligature down through this into the vagina and thence up through the posterior cul-de-sac, which it perforates. This ligature is tied, and the broad ligament enclosed divided, leaving the uterus attached by the other broad ligament and the tissues forming the posterior cul-

de-sac. A second ligature is passed similarly to the first, but enclosing all these remaining structures, is tied, and the uterus freed from all attachments.

Malignant Disease of the Breast and Uterus.—F. B. Jessett[25] in discussing this subject states that malignant disease, wherever situated, is much more likely to recur in persons under 30 or 50 than it is in people over 50. He believes it is absolutely necessary for patients to be advised to submit to repeated operations, and that they should be examined every two or three months for at least two or three years after the operation. The form of the disease is an important factor in the prognosis. If we have to deal with sarcoma the risk of recurrence is comparatively small if seen sufficiently early. In duct cancer the chances of recurrence are less than when a distinct nodule is found. Soft and rapidly growing scirrhi are more likely to return than in atrophic scirrhus. After operation on the breast, to avoid fibrous contractions, he fixes the arm by means of a bandage to the top of the bed, so as to have it slung at right angles to the side. The arm is kept in this position for one week. Malignant disease of the os and lower part of the cervix are most favorable for operation; the next most favorable location for the disease to be in is the body of the uterus. The most unfavorable cases are those in which the disease commences in the cervical canal, as the tissues in the roof of the vagina and the lymphatics therein become very quickly infected.

Imperforate Hymen.—R. J. Kinkead[29] reports the case of a young girl 13 years old. The patient complained of severe pain in the abdomen; she had never menstruated; suffered from constipation; had not vomited or had any difficulty in passing her urine. On examination a projecting mass was seen at the vaginal orifice, shining, greenish-blue in color, long axis from above downward. Its tissue resembled the normal hymen. The uterus reached the umbilicus. The hymen was incised and the fluid withdrawn.

O. Smithson[29] reports a case of retention of urine caused by retained menstrual blood, in a girl 16 years old. She had an imperforate hymen, which was incised and the fluid allowed to pass off.

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DISEASES OF CHILDREN.

Acquired Hydrocephalus.—Grosz [1] reports the case of a 10 months-old boy, well nourished and apparently healthy, who was suddenly attacked by convulsions, followed by strabismus and, five weeks later, total blindness. The head grew large, reaching a circumference of 48 centimetres. Puncture of the anterior fontanelle was performed twice, and great, permanent improvement in the child's sight resulted. The head ceased to grow larger, and the baby grew both physically and mentally. The condition was undoubtedly one of internal hydrocephalus following a cerebro-spinal meningitis. Puncture should be done under mild narcosis and with strictly antiseptic precautions, and should be followed by a tight compress and dressing for some days, at least until no new pressure symptoms appear to indicate another puncture.

Convulsions in Infancy.—A. M. Gossage [2] and J. A. Coutts [2] consider that the frequency of convulsions in infants has been vastly overrated; that the immediate danger of a fit has been overrated, while the danger as regards future neurotic manifestations has been underestimated. They also consider that the predisposing causes are of much more importance than the exciting causes; the slighter exciting causes will not produce convulsions except in predisposed infants. All that is necessary during an actual attack of convulsions in most cases is to loosen the clothing about the neck, chest, and abdomen, and to lay the child on its back, with the head slightly raised, until it recovers consciousness from the fit and the subsequent drowsiness. A hot bath does no harm, and a mustard bath may be stimulating if the child is in feeble health. Where unconsciousness is unduly prolonged, chloroform inhalation is the most efficacious treatment. It may be replaced, or in severe cases followed, by the rectal injection of chloral, in doses of three grains to an infant of 6 months, to which two or three grains of potassium bromide can be added if desired.

Diabetes in Childhood.—Bogorus [1] observed 20 cases in children under 16 years of age. Nearly 500 cases have been reported in literature. The disease increases in frequency with age, there being only 13 under 1 year and over 200 between 10 and 15 years. The diagnosis rests, of course, upon the finding of sugar in the urine. For this purpose it is best to collect the entire quantity for twenty-four hours. The disease has two stages, the latent and the acute. During the latter the urine contains much sugar, no albumin, but a good deal of acetone, and occasionally it gives a marked diazo-reaction. This stage is not prolonged beyond a few months, as a rule, and usually ends in coma. The age of the child seems to influence the duration of the disease, which is almost invariably fatal. The chief characteristics of these juvenile diabetes cases are: very frequent hereditary handicap of the peculiar course, the almost invariably fatal termination, the negative postmortem findings, and the absence of complications.

Experimental Study of Children, more especially of
Washington School Children.—Arthur Macdonald,[2] special-
ist in the Bureau of Education, says that to establish the
measure of work according to the strength of the individual is
fundamental to the economy of health.   This is especially true
of children, but the difficulties here are greater than in adults,
owing to the changes caused by growth.   Overtaxing of the
powers here leaves its mark generally throughout the whole
future life of the child.   No questions, then, can be more im-
portant for the school, according to Combé, than: (a) What
is the maximum work suitable to a child in the different peri-
ods of development in its school life? (b) Can this maximum
be injurious at certain times when all the vital force may be
required for growth? We must first know the physiology of
normal growth—whether it is regular, and when it increases or
decreases in rate, and what influences this increase and de-
crease.   There are two methods of pursuing such an investi-
gation—the collective method and the individual method.
The first consists in measuring large numbers of children of
every age and obtaining the average or mean for each age, the
value of which is in proportion to the number measured.   The
individual method was employed by Liharzik in Vienna, who
investigated 200 from 8 to 14 years of age, measuring them
each year.   To find the norm, the average, the type or types
of the great mass of children can be done only by measure-
ments on large numbers, these measurements to be summar-
ized according to the statistical method.   There is doubtless in
the early periods of life, up to adult age, a certain relation of
bodily organs to one another.   A want of such relation may
produce abnormalities, which may affect beauty, grace, sym-
metry, and, what is more important, health.   When abnor-
malities are discovered early in youth there is more opportu-
nity of avoiding their ill effect.   The relation of these body
abnormalities to disease may prove of practical importance.
Thus, Hildebrand, an experienced investigator, remarks that
delicate, slender people are much more subject to typhoid
fever than to consumption; another says of the same class that
they are much more inclined to nervous troubles than other
people.   Another physician of large experience asserts that
where chest and trunk remain undeveloped the head and
extremities are much more developed.   Beneke has shown that
the relation between the size of the heart and the circumfer-
ence of the arteries is gradually changed during the growth of
the body, and that there is a consequent variation in blood
pressure.   Thus, the growth in the length of the body can be
of the greatest importance to the development of the heart.
Should this growth ·be irregular or abnormally fast, serious
difficulties may arise, and Beneke has endeavored to show that
herein lies the cause of development of consumption at puberty.
The importance, therefore, of determining the normal rate of
growth is evident.   Washington is a residential city with
comparatively few foreigners.   There is a very general repre-

sentation from all States among the residents. In the study of the Washington school children several lines of investigation have been followed. One is a special study of 1,074 children based upon measurements by the author. Another is an anthropometrical and sociological study of all the school children based upon measurements by the teachers. A third is a purely psychological inquiry as to comparative mental ability in the different school studies, as reported by the teachers. A fourth is the study of the abnormal children in the schools, as reported by the teachers. As to the value of such work, Virchow says of the teachers of German who assisted in the investigation of the school children that they were following out the end for which the schools strive—that is, self-knowledge; for such investigations aid in the question as to the origin of a people, that a nation may know itself.

CONCLUSIONS AS TO WASHINGTON SCHOOL CHILDREN. *Conclusions as to 1,074 children specially studied.*—1. Dolichocephaly, or long-headedness, increases in children as ability decreases. A high percentage of dolichocephaly seems to be a concomitant of mental dulness. 2. Children are more sensitive to locality and heat on the skin before puberty than after. 3. Boys are less sensitive to locality and more sensitive to heat than girls. 4. Children of the non-laboring classes are more sensitive to locality and heat than children of the laboring classes. 5. Colored children are much more sensitive to heat than white children. This probably means that their power of discrimination is much better, and not that they suffer more from heat.

Conclusions as to all school children.—6. As circumference of head increases, mental ability increases (it being understood that the race is the same). 7. Children of the non-laboring classes have a larger circumference of head than children of the laboring classes. 8. The head circumference of boys is larger than that of girls, but in colored children the girls slightly excel the boys in circumference of head. 9. Colored girls have larger circumference of head at all ages than white girls. 10. An important fact already discovered by others is that, for a certain period of time before and after puberty, girls are taller and heavier than boys, but at no other time. 11. White children not only have a greater standing height than colored children, but their sitting height is still greater; yet colored children have a greater weight than white children —that is, white children, relatively to their height, are longer-bodied than colored children. 12. Bright boys are in general taller and heavier than dull boys. This confirms the results of Porter. 13. While the bright colored boys excel the dull colored boys in height, the dull excel the bright in sitting height. This seems to indicate a relation or concomitancy of dulness and long-bodiedness for colored boys. 14. The pubertal period of superiority of girls in height, sitting height, and weight is nearly a year longer in the laboring classes than in the non-laboring classes. 15. Children of the non-laboring

classes have, in general, greater height, sitting height, and weight than children of the laboring classes. This confirms the results of investigations by Roberts, Baxter, and Bowditch. 16. Girls are superior to boys in their studies (but see conclusion 19). 17. Children of the non-laboring classes show greater ability in their studies than children of the laboring classes. This confirms the results of others. 18. Mixture of nationalities seems to be unfavorable to the development of mental ability. 19. Girls show higher percentages of average ability in their studies than boys, and therefore less variability. This is interpreted by some to be a defect from an evolutionary point of view, but see conclusion 16. 20. As age increases, brightness decreases in most studies, but dulness increases except in drawing, manual labor, and penmanship—that is, in the more mechanical studies. 21. In colored children brightness increases with age, the reverse of what is true in white children.

CONCLUSIONS AS TO CHILDREN WITH ABNORMALITIES.—22. Boys of the non-laboring classes show a much higher percentage of sickness than boys of the laboring classes. 23. Defects of speech are much more frequent in boys than in girls. 24. Boys show a much greater percentage of unruliness and laziness than girls. 25. The dull boys have the highest per cent of unruliness. 26. Abnormalities in children are most frequent at dentition and puberty. 27. Children with abnormalities are inferior in height, weight, and circumference of head to children in general.

Heart, Transposition of Large Arteries of.—Rolly[4] reports the case of an 8-months-old child, cyanotic, poorly nourished, and with a systolic murmur, who died two months later of enteritis complicating atelectasis and congenital cardiac malformation. The autopsy showed the heart to be much broader than normal, the right ventricle larger and more muscular, the ventricular septum incomplete, foramen ovale open, and transposition of the aorta and pulmonary artery. There were no other congenital anomalies and no signs of syphilis. The lungs were atelectatic and the liver fatty. The absolute intra-vitam diagnosis of transposition of the large vessels is impossible, but it may be surmised when all the clinical symptoms point to congenital heart disease and the local signs are: clear heart sounds, enlargement of cardiac area to the right, cyanosis not due to pulmonary complications, dyspnea, and a loud, accentuated second sound. The last sign would exclude pulmonary stenosis. A systolic murmur not located at any orifice would point to an open septum or ductus Botalli. The prognosis in these cases is always bad. Vierordt found that 58 of 75 cases lived only one year, and of the remainder only 6 reached the age of 11.

Intestinal Invagination, Case of Double.—Von Hippel[5] operated upon a boy 1¾ years old whose symptoms and their sudden onset pointed to the presence of an intestinal invagination. It was found that two intussusceptions were present,

one typically ileo-cecal and more recent, the other iliac and older. Resection of the latter was necessary. The child died seven hours after the operation. At the autopsy an acute peritonitis was found, but no other lesion.

Night-Terrors.—Leonard Guthrie[6] thus sums up a long and valuable article on the subject: 1. Night-terrors are always to be regarded as evidence of ill-health. 2. They may for convenience be divided into those of symptomatic and those of idiopathic origin. But *per se* the two cannot be distinguished. 3. Hallucinations of vision are usually due to febrile disturbance. 4. The content of the dream may, in some cases, throw light on its cause. 5. The character of the dreamer is of more importance than that of the dream. 6. In simple cases simple treatment based on the cause suffices. In idiopathic cases not only local causes of irritation, but the environment and nature of the patient, have to be considered. He further says that in all kinds of night-terrors nerve sedatives are useful. Even in the most straightforward of symptomatic cases it is as well to give a sleeping-draught for a few nights after an attack has occurred, for oft-repeated attacks tend to make a child timid and nervous, even if not so by nature. In symptomatic cases the author usually gives paraldehyde in doses of fifteen to twenty minims for a child of 5. The bromide of ammonium may be combined with other drugs, such as ferri et ammonii citras in anemia; with bismuth, gentian, rhubarb, castor-oil emulsion, in gastro-intestinal troubles; or with strophanthus, digitalis, citrate of caffeine when cardiac stimulants are needed; or with nux vomica and hypophosphites, emulsion of cod-liver oil, in debility. Quinine is not usually good for highly neurotic children; when given it should be with hydrobromic acid. When there are no special reasons for such combinations as the above the mixed bromides of soda, potash, and ammonium may be given in suitable doses. The author usually treats markedly neurotic children as if they were epileptics, with a long-continued course of mixed bromides. He has never seen any harm result from the practice so long as the dose was not excessive and care was taken to add stomachics or tonics, or arsenic in cases of acne, when required.

Nose, Loop for the Extraction of Foreign Bodies from the.—Wladimiroff[7] has invented an instrument consisting of a metal shaft with a loop at either end, the edges of the loop being perfectly blunt. The shaft is 6 centimetres long, the loops 5 centimetres long by 3 millimetres wide and bent at an obtuse angle to the shaft. The foreign body can be easily and readily removed by this means without the aid of rhinoscope or reflector. The instrument is also of value for diagnostic purposes, as its introduction is harmless and simple. A case is reported in which a button could not be removed from the nostril of a boy even after an incision two by one-half centimetres had been made. Upon seeing the case the author at once succeeded in removing the button with his blunt loop, without even disturbing the sutures in the wound.

Otitis Media complicating Scarlet Fever and Measles.—
Charles H. May [8] divides this complicating affection into two
kinds: 1. Inflammation of the catarrhal type, in which the
secretion and discharge are mucous or sero-mucous, often con-
taining a small number of pus cells, in which there is compara-
tively little direct damage to the contents of the tympanum
and its walls. 2. The purulent form, in which the secretion
and discharge are distinctly purulent or muco-purulent, and
there is always more or less destruction of the contents of the
tympanic cavity and often of its walls. The treatment may
be divided into (1) *Preventive*, (2) *Abortive*, (3) *Paracente-
sis* of the drum membrane. In regard to the first, attention
to the nose and throat has some restraining influence upon the
tendency of the inflammation to spread from these parts to the
ear. The nose and throat should be kept as clean as possible.
The nostril of one side should always be compressed while an
expiratory effort is directed to the other; by this means the
force of the column of air is not scattered through the nose,
throat, tubes, and middle ears. When patients are unable to
cleanse their own nose and throat, these may be swabbed with
a solution of sodium chloride, three-quarters of one per cent, or
any weak, warm cleansing or antiseptic solution applied upon
cotton on a straight applicator for the nose and a bent one
for the throat. As soon as there are evidences of aural com-
plication the abortive treatment should be begun. Absolute
rest is of the greatest importance and must be secured, even
by the administration of an opiate or other sedative. Acetan-
ilid and caffeine may be given to relieve the pain. Evacuation
of the bowels, light diet, proper temperature of the room, and
the avoidance of draughts of cold air are to be looked after.
Dry heat should be employed by means of a hot-water bag,
upon which the ear is allowed to rest; poultices are not desir-
able. Hot water may be allowed to run into the canal to ease
the pain; its temperature should be 115° F., and it is customary
to dissolve a teaspoonful of salt or of boric acid in each pint.
The water may be heated in a tablespoon and poured in, this
being repeated every few minutes until the pain subsides, or it
may be allowed to flow in from a fountain syringe held only
just high enough to allow the water to escape. Leeches upon
the region in front of the tragus, or an artificial leech or scari-
ficator and cup, may be applied and an ounce of blood with-
drawn. The writer is in favor of inflation properly applied,
preferably by means of a catheter, or, failing this, by the
Politzer method. The nose and throat must be previously
cleansed and inflation very gently practised. Suction of the
tube and tympanum is combined with inflation by the author.
After the catheter has been introduced and the middle ear in-
flated, the finger is placed upon the valve of the bag while in a
compressed condition. The elasticity of the rubber tends to
cause the bag to assume its original shape, and, since no air
can enter through the valve, a suction force is generated.
By allowing a little air to enter by releasing the finger for a

moment, again applying the finger, and continuing this alternately, the contents of tube and tympanum tend to be drawn toward the catheter. If these procedures are unsuccessful, if the symptoms continue for twelve hours, or diminish during the day to come on with increased severity during the night, the membrane must be incised without delay. The operation sometimes has to be repeated because of closing of the opening. Aural complications of scarlet fever and measles are somewhat less frequent than formerly, and the author considers the improvement in results to be due to the following reasons: 1. Cases of scarlet fever have been of a mild type in recent years. 2. It is customary to remove adenoids at a comparatively early period of life; the result of such interference is to diminish the risk of extension of the inflammation from the throat to the ears, if the child is attacked with scarlet fever. 3. More attention is paid to the condition of the nose and throat during the progress of the disease and before aural complications occur. 4. Paracentesis is resorted to more frequently and earlier than was the case formerly.

David Newton Blakely [19] gives the results of the study of 649 cases of scarlet fever, of which 86 (or 13.25 per cent) had acute middle-ear inflammation. Of 341 patients ill with measles, 51 (or 14.96 per cent) had acute middle-ear inflammation. In comparing the series of cases of measles with that of scarlet fever, the two most striking differences are: (1) the greater number of mastoid operations; (2) the greater number of ear inflammations in adult patients in the former. Out of 51 measles patients, 6, or 11.7 per cent, required mastoid operations, while of 8.6 scarlet fever patients, only 3, or 3.49 per cent, required it; 23.53 per cent of the ear inflammations in measles occurred in patients over 20 years of age, while there was not a single case in scarlet fever patients of the same age. Other points of difference are: (1) that in measles the ear symptoms, as a rule, occurred earlier in the disease than in scarlet fever; (2) that in measles the duration of the ear trouble was less than in scarlet fever; (3) that in measles pain was a constant symptom before paracentesis or rupture of the membrane, but in scarlet fever it was sometimes absent. The conclusions reached by the author are, that acute middle-ear inflammation occurs frequently in both scarlet fever and measles, a little oftener in measles than in scarlet fever; in scarlet fever, though a frequent complication in children, it is rare in adults; in measles, though more frequent in children than in adults, it is by no means uncommon in the latter. It may begin at any time in the course of the disease; all grades of severity are met; early treatment tends to shorten the course of the inflammatory process. So far as danger to life is concerned, it is not a serious complication. The author thinks that the importance of early paracentesis, both as affording relief from pain and preventing destruction of tissue in the membrane or other parts of the ear, can hardly be overestimated.

Otitis Media and Earache in Lobar Pneumonia of Children.—J. S. Meltzer,[9] at the end of a detailed and interesting article upon the subject, says that he has endeavored to bring out the following points: 1. Otitis media is an extremely frequent disease in children, especially in poorly nourished ones. 2. Broncho-pneumonia is very frequently complicated with otitis media. 3. In lobar pneumonia of children purulent otitis media is at least very rare, possibly because the pneumonia by its hyperleucocytosis acts as a derivative upon the otitis. 4. Many cases of lobar pneumonia begin with an earache, which disappears gradually. 5. The hypothesis is offered that possibly this is only a sympathetic pain of the chronically inflamed drum. 6. In offering this hypothesis the idea is introduced of a summation within the central organ between the effects of an abrupt and of a continuous stimulus—a conception which might prove to be fruitful in pathology, in which all the chronic and many acute inflammations are the seat of such continuous nerve stimulations.

Paralysis, Infantile.—Christo Karoleff[10] gives the following conclusions reached in his thesis: 1. Traumatism of the head (probably accompanied by lesions of the cortex and the brain) may, in children, cause a cerebral spasmodic hemiplegia, either with contractures or athetosis. 2. Durable aphasia may be caused by traumatism of the right side of the head. 3. Left cerebral infantile hemiplegia may be accompanied by aphasia, but this is rare. 4. In cerebral infantile hemiplegia the affections of speech may last longer than most authors state (one month), and the author has observed a case in which almost complete hemiplegia is still persistent after a lapse of two and a half years. 5. A child suffering from cerebral hemiplegia of traumatic origin may have a Parkinsonian course without presenting the other symptoms of Parkinson's disease. 6. Comitial crises do not inevitably appear. 7. The affected limbs may at a given moment present abnormal movements which are not choreic or athetosic, nor do they belong to any known type. 8. In spasmodic infantile tabes dorsalis (Little's disease) the four limbs may be affected in equal degree, although the classic writers say that, as a usual thing, the lower limbs are more severely affected than the upper limbs. 9. There is an infantile affection of the lower limbs which has not previously been described, which is characterized by paresis and is intimately related to dentition.

Post-diphtheritic Paralysis with Unique Edema.—Kraus[4] observed the case in a girl 9 years old, who had been healthy until attacked by diphtheria. This was followed by weakness in the legs and eyes, paralysis of the soft palate, and swelling of the skin over the neck and back. There was no pain or fever, and no atrophy or inco-ordination. The child could neither sit nor stand. Edema of the arms and legs developed, and later of the eyelids and cheeks. The urine contained no albumin, and within two months the edema had disappeared and the walk was as good as ever. The case must have been one of

polyneuritis with a lesion involving the vasomotor tracts partly within the cord and partly in the peripheral nerves. It is the only case in literature with so marked an edema of neurotic origin accompanying post-diphtheritic paralysis.

Rachitis: Treatment with Suprarenal Substance. — Stoeltzner [11] studied the treatment in 76 cases of rachitis, and concludes: The general condition, restlessness, sensitiveness, sweats, and the craniotabes are benefited by suprarenal extract, often within one or two weeks; dentition, and the ability to sit, stand, and walk, are decidedly quickened, and the softness of the thorax disappears; the large fontanelle, the thorax deformity, and the epiphyseal enlargements are less amenable to the treatment, while spasms of the glottis are almost always very resistant; the improvement is rapid during the first few weeks, then rather more slow; if the treatment be interrupted the disease remains stationary or progresses, to improve again when treatment is resumed. Even in severely complicated cases improvement is marked. One case died of acute capillary bronchitis after one month's use of the suprarenal substance, and histological studies of the bones showed a very great improvement upon the lesions of rickets.

Rumination in a Boy of Nine Years. — Luther C. Peters [12] reports the case of a boy who at first voluntarily, and then from force of habit, regurgitated, rechewed, and swallowed his food. Under a tonic, sedative, and suggestive line of treatment he practically overcame the habit. The condition is a rare one, even in adult life, and its rarity in children may be judged by the fact that there is a total absence of any discussion of the subject in most of our modern text books on diseases of children. Among children the phenomenon occurs most frequently in idiocy, and in these subjects is usually caused by boulimina. It does, however, occur in children of normal mental development, in whom, as in adults, there is a history of some disturbing nervous element. The conclusions reached by the author are: 1. Rumination is a neurosis, associated with a profound neurasthenic condition, or idiocy. 2. It is not, as a rule, associated with a diverticulum or dilatation of the lower end of the esophagus, but is primarily a stomach neurosis. 3. It may at times be hereditary. 4. It occurs more frequently in males than in females. 5. It usually is within control of the will. 6. The prognosis as to cure is good.

Scarlatina. — Tinsley Brown [13] says that in the management of this disease a proper and early diagnosis should be made. The laity should be well instructed in the nature of the disease; mild cases are as apt to communicate the disease to others as severe ones; the case imparted by a mild form may be severe, and severe sequelæ may follow a mild case, especially inflammation of the kidneys. Every case should be quarantined. There should be thorough disinfection. There should be complete desquamation before release from quarantine. If such precaution is not taken the disease may be communicated for an indefinite period of time. Disinfection should follow

prescribed rules approved by boards of health in cities or towns. Heat, by baking in the oven or some special apparatus, is sufficient for clothing which cannot enter the wash-boiler; sulphur fumes, or formaldehyde for twelve hours, for rooms and imponderable articles. The physician who has charge of a case of scarlatina should be very careful about disinfecting himself.

Spleen, Extirpation after Subcutaneous Rupture.—Krabbel[19] reports the case, which occurred in a boy $9\frac{1}{2}$ years old who fell down-stairs, striking his abdomen upon the lowest step. The symptoms of internal hemorrhage were present, and an operation was done three and a half hours after the accident. A large quantity of clotted blood was found in the abdominal cavity, and also two pieces of spleen torn from the organ. The severe hemorrhage necessitated a total removal of the spleen. The boy recovered perfectly and was discharged in excellent condition. Two weeks after the operation the lymph nodes became enlarged, but the thyroid remained unchanged. Rupture of the spleen is not a very uncommon accident, and may be followed by spontaneous cure, but operation without delay is the only safe treatment.

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ITEM.

THE THIRTEENTH INTERNATIONAL MEDICAL CONGRESS will be held in Paris from the 2d to the 9th of August, 1900. All graduates in medicine are eligible for membership upon application to the Secretary of the American National Committee, Dr. H. Barton Jacobs, 3 West Franklin Square, Baltimore, Md., and the payment to him of the membership fee of $5. Any information needed can be obtained from Dr. Jacobs. Members desiring to present papers, which are limited to fifteen minutes, must forward the title and a résumé before May 1, 1900, to the secretary of the section to which they belong.

ERRATUM.

The discussion of Dr. McMurtry's paper on page 731 of the November JOURNAL should be accredited to Dr. Thomas B. Eastman and not to Dr. Joseph Eastman, as printed.

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